W1.5
A8J
A6J

AAMC

JOURNAL
of the
Association of American Medical Colleges

SEP 16 1937

Volume 12 SEPTEMBER, 1937 Number 5

CONTENTS

Tests of Medical Aptitude at Minnesota 257
J. W. Cavett, A. T. Henrici and S. B. Lindley

Philosophical Comments on Examinations 269
Howard T. Karsner

Clinical Teaching in the Outpatient Department 279
Winthrop Wetherbee, Jr.

Some Interesting Data on Medical Students Obtained from the Student Register 299
Fred C. Zapffe

Southern Medical Colleges Must Maintain Enrolment at Least at Its Present Level 301
O. W. Hyman

A Study of Medical School Diplomas 305
G. Lombard Kelly and Janet Newton

Program for the Forty-eighth Annual Meeting 308
Editorials 309
College News 311
General News 316
Book News 320
Trends in Medical Practice 321
H. G. Weiskotten

JUST READY!—NEW (4th) EDITION

Cecil's Textbook of Medicine

Completely Remade with Many New and Rewritten Subjects—Up-To-Date!

See SAUNDERS ADVERTISEMENT — *just inside*

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

OFFICERS FOR 1936-1937

President: E. STANLEY RYERSON, Toronto, Canada
President-Elect: ALAN M. CHESNEY, Baltimore
Vice-President: LOREN R. CHANDLER, San Francisco
Secretary: FRED C. ZAPFFE, Chicago
Treasurer: A. C. BACHMEYER, Chicago

EXECUTIVE COUNCIL

E. STANLEY RYERSON, Chairman, Toronto, Canada; ALAN M. CHESNEY, Baltimore; JOHN WYCKOFF, New York City; LOREN R. CHANDLER, San Francisco; C. W. M. POYNTER, Omaha; MAURICE H. REES, Denver; W. C. RAPPLEYE, New York City; R. H. OPPENHEIMER, Atlanta, Georgia.

MEMBERS

Alabama

University of Alabama, School of Medicine, University.

California

College of Medical Evangelists, Loma Linda and Los Angeles.
Stanford University School of Medicine, San Francisco and Stanford University.
University of California Medical School, San Francisco and Berkeley.
University of Southern California School of Medicine, Los Angeles.

Canada

McGill University Faculty of Medicine, Montreal.
Queen's University Faculty of Medicine, Kingston.
University of Alberta Faculty of Medicine, Edmonton.
University of Manitoba Faculty of Medicine, Winnipeg.
University of Toronto Faculty of Medicine, Toronto.
University of Western Ontario Medical School, London.

Colorado

University of Colorado School of Medicine, Denver.

Connecticut

Yale University School of Medicine, New Haven.

District of Columbia

Georgetown University School of Medicine, Washington.
George Washington University School of Medicine, Washington.
Howard University College of Medicine, Washington.

Georgia

Emory University School of Medicine, Atlanta.
University of Georgia School of Medicine, Augusta.

Indiana

Indiana University School of Medicine, Bloomington and Indianapolis.

Illinois

Loyola University School of Medicine, Chicago.
Northwestern University Medical School, Chicago.
University of Chicago Medical Schools, Chicago.
University of Illinois College of Medicine, Chicago.

Iowa

State University of Iowa College of Medicine, Iowa City.

Kansas

University of Kansas School of Medicine, Lawrence and Rosedale.

Kentucky

University of Louisville School of Medicine, Louisville.

Louisiana

Louisiana State University School of Medicine, New Orleans.
Tulane University of Louisiana School of Medicine, New Orleans.

Maryland

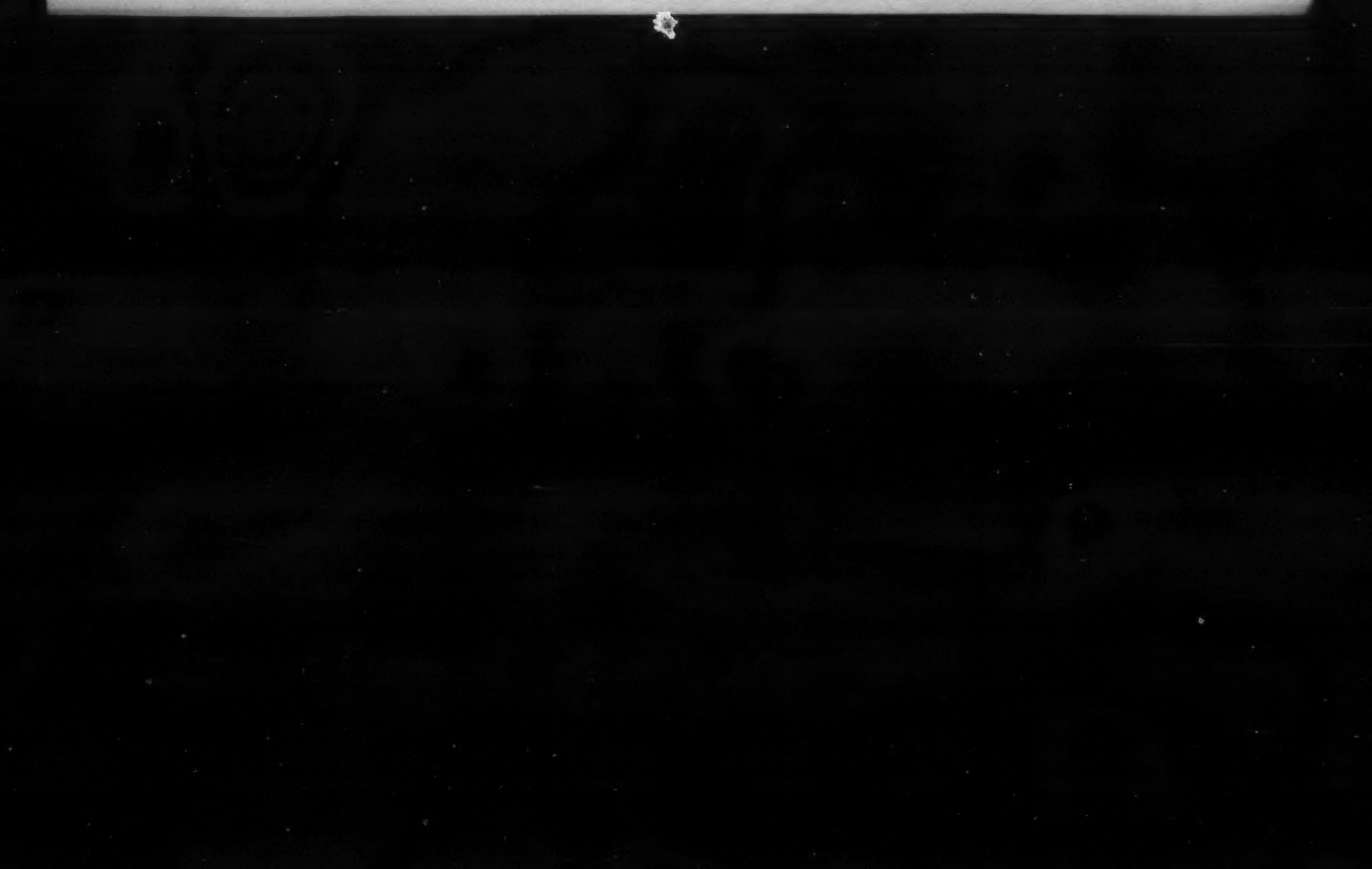
Johns Hopkins University School of Medicine, Baltimore.
University of Maryland School of Medicine, Baltimore.

Continued on Third Cover Page

Published bimonthly, January, March, May, July, September and November, at 5 South Wabash Avenue, Chicago, Illinois, by the Association of American Medical Colleges. Subscription price $3.00 per year. Single copies, 75 cents.

Entered as second class matter January 17, 1930, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

(Continuing the Bulletin of the Association of American Medical Colleges)



JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 12 SEPTEMBER, 1937 Number 5

Tests of Medical Aptitude at Minnesota

J. W. CAVETT, PH.D.; A. T. HENRICI, M.D., AND S. B. LINDLEY, PH.D.
University of Minnesota
Minneapolis, Minn.

The University of Minnesota tests in medicine were devised to fit an unusual local situation. The Moss Medical Aptitude Test, of considerable value in many medical institutions, had proved to be quite ineffective as a basis for predicting the probable scholastic success of prospective students in the Medical School of the University of Minnesota. The premedical college grades, though considerably more useful than the Moss test, did not furnish a sufficiently satisfactory basis for prediction as judged by the coefficient of correlation with the grades earned in the medical school. Furthermore, statistical combination of the scores made on the Moss test and the average premedical college grades did not yield a measure significantly more effective than the premedical grades alone.

The investigation reported here is one aspect of one of eleven research projects sponsored jointly by the Board of Admissions and the Committee on Educational Research of the University of Minnesota and carried on under the direction of Professor Harl R. Douglass of the College of Education, a member of the Board of Admissions. One of the authors of the report, Dr. Stanley B. Lindley, is a research assistant in the Committee on Educational Research and assigned to the Medical School research project. Professors Cavett and Henrici are resident members of the faculty of the Medical School and developed much of the material of the locally devised aptitude tests. Others contributing to the development of such material were Dr. E. P. Lyon, then dean of the Medical School, Professor P. O. Johnson of the Committee on Educational Research, and Dr. S. E. T. Lund, now of the University of Tennessee, formerly of the Committee on Educational Research.

The most direct approach to the problem seemed to be that of constructing an aptitude test which would duplicate, in a miniature form, the basic types of tasks and problems encountered by a student in the first years of his medical studies at the University of Minnesota. Efforts were restricted to the first year of medicine for a variety of reasons, the two most important being that the greatest number of failures in medical school occur in the first year, and, secondly, that the two authors who are on the instructional staff of the medical school were both more intimately acquainted with the curriculum of the freshman year and felt more confident of their ability to analyze that curriculum than that of the following years.

Three batteries of aptitude tests have been assembled and used on three successive classes of medical students. The first set of tests, the University of Minnesota Tests in Medicine, Battery 1, 1935w, was given to the entire freshman class in January, 1935. The other two batteries of tests were given in May, 1935, and May, 1936, to the applicants for entrance to the medical school.

THE APTITUDE TESTS

Types of tests employed. In all, nine different types of test material were employed in this investigation. A description of each of these types and data relative to their validity for purposes of predicting probable scholastic success in the medical school is given in the following paragraphs. The types of tests were:

1. Tests of comprehension and retention of reading material.
2. Tests of ability to classify reading materials in outline form.
3. Tests of ability to recognize relevancy of facts to problematic situations.
4. Tests of ability to recognize inconsistencies in statements.
5. Tests of ability to solve non-numerical problems in science.
6. Science survey tests calculated to sample the knowledge of facts in various fields of high school and elementary college courses in science—particularly biological sciences.
7. Tests of ability to classify terms.
8. Tests of ability to recognize and classify characteristics common to a group or series of objects.
9. Tests of ability to judge spatial relations of spatial imagery.

Tests of comprehension and retention. In every way analogous to the test of the same title employed by Moss for many years, locally devised tests of reading comprehension and retention proved to be quite ineffective for predictive purposes. Such tests were included in the batteries used in January and May of 1935 and, as may be seen in tables 1 and 2, this test had negligible correlations with the grades in all of the courses as well as with the total grade of the freshman year (Honor Points). None of the coefficients of correlation were above .09. This test was abandoned and not included in the battery given in May, 1936. Moss has not used this test in the latter forms of his aptitude test. This test requires the student to read a page of organized and condensed technical material and then answer questions of fact concerning the reading matter after a short interval and in absence of the reading matter.

The time granted for study of the textual material in this test is sufficient for several readings, we allowed 10 study minutes for approximately 470 words. A test of this nature has a structural weakness, for it is extremely difficult to provide enough organized and related facts in a reasonable length of time to furnish material for a statistically satisfactory number of questions of fact. In our form of the test we were limited to fifteen true-false questions, and many of these were not of any discriminatory value, i.e., they were answered correctly by all of the students.

Classification by Outline. This was the first form of our classification tests and was used only in the 1935w battery of the Minnesota tests. It yielded a maximum correlational value of .19, with embryology final grades (Table 1). With this test we attempted to determine the student's ability to make a clear concise outline, with proper regard for major and minor points, of a page of organized and complete textual material. The student retained the page of reading material while composing the outline, therefore the memory factor played no part in this test. The student was instructed to make the outline on a specified page on which he found a skeleton framework consisting of numbered lines, properly indented, on which were to be entered the major and minor headings

TABLE 1. Correlations between the predictive variables and the final grades in the various courses which taken together constitute the total final grade for the first year of medicine for the Class of 1938. Minnesota tests given in January, 1935. Number of cases range from 129 to 136.

Predictive Variable Minnesota Tests	Physiol. Chemistry	Gross Anatomy	Histology	Embryology	Bacteriology
1*	.07	−.08	.09	.02	.04
2*	.11	.13	.16	.19	.08
3*	.28	.02	.26	.24	.29
4*	.14	.10	.17	.15	.16
5*	.37	.25	.33	.27	.24
6*	.29	.19	.20	.13	.14
Total 1-5	.32	.15	.33	.30	.28
Total 1-6	.36	.19	.32	.25	.26
Moss Aptitude	.33	.15	.24	.23	.23
Premedical H.P.R.	.59	.49	.48	.42	.49

1* Comprehension and Retention.
2* Classification by Outline.
3* Relevancy.
4* Inconsistencies.
5* Problem Solving.
6* Science Survey.

in the proper order of relationship. The skeleton outline may have partly defeated the purpose of the test by giving too much aid to the student, but without it the scoring of the tests would have been almost impossible. The test was made up of two such units of reading material and accompanying sheets for outlines. Those taking the test were allowed 9 minutes to complete one of these exercises and 12 minutes for the other. In scoring, one point was granted for each major heading and the same amount for each subordinate heading under its correct major heading. The maximum score the student could earn was 30 points.

Relevancy. The test suffered two weaknesses. The correlation of scores made in it with final grades earned in gross anatomy was practically zero. Secondly, the relevancy test had relatively high correlations with the other components of the battery indicating that it might be duplicating the functions of the other tests. These facts, together with the difficulty in constructing this type of test item, led to its abandonment.

The test of relevancy was an adaptation of the relevancy test which has been found to be peculiarly effective in the aptitude tests used in the law schools at Yale University and at the University of Minnesota. In our form a hundred words or less were devoted to describing a situation, a reaction or some form of behavior. The descriptions were followed by a series of statements pertaining in varying degrees to the premises involved in the preceding descriptions or accounts. The student was asked to indicate in the case of each statement whether or not it was relevant to the situation about which he had just read. The test was composed of five such units. The students were allowed 15 minutes for completion of this test. The maximum number of points obtainable in this test was 41.

TABLE 2. Correlations between the predictive variables and the final grades in the various courses which taken together constitute the total final grade for the first year of medicine for the Class of 1939. Minnesota tests given in May 1935. Number of cases, 88-97.

Predictive Variable Minnesota Tests	Physiol. Chemistry	Gross Anatomy	Histology	Embryology	Bacteriology
1*	.07	−.05	−.02	−.01	.05
2*	.12	.19	.20	.26	.18
3*	−.04	.08	.02	.11	.05
4*	−.02	.15	.26	.24	.09
5*	.20	.14	.20	.10	.18
6*	.27	.18	.07	.17	.22
Total 1-5	.07	.14	.13	.19	.14
Total 1-6	.18	−.02	.14	.22	.22
Moss Aptitude	.14	.08	.19	.25	.26
Premedical H.P.R.	.43	.45	.38	.38	.27

1* Comprehension and Retention.
2* Classification of Terms.
3* Classification of Characteristics.
4* Spatial Relations.
5* Problem Solving.
6* Science Survey.

In Battery 1, 1935w of the Minnesota tests the relevancy test was second only to problem solving with respect to closeness of correlations with the total grade for the first year of medicine. The coefficient of correlation was .29.

Inconsistencies. This was a test of analysis of textual material for the purpose of discovering statements inconsistent with each other. This test was borrowed without modification from the Stanford Scientific Aptitude Test (Zyve) and was included only in Battery 1. The correlations of the results on this test with the medical grades were so uniformly low that it was not incorporated in the last two forms of the Minnesota tests. The highest coefficient of correlation was with histology—.17 (Table 1).

Problem Solving. Clearly the most successful test in Battery 1, 1935w was the problem solving section. This test not only showed relatively high correlations with grades in each course of the first year of medical studies but showed the highest correlation with the total final grade for the first year. The latter

correlation was .36 (Table 3). Problem solving was second only to premedical college grades in predicting the final grade earned in the first year. It had a correlation of .37 with the final grade in physiological chemistry (Table 1). In Battery II, 1935w, it was among the best of the tests in predicting the final grade for the first year for the members of the class of 1939. It yielded a correlation of .24 with the total grade and was bettered by one of the classification tests, the science survey, and by the premedical college grade (Table 4). This second version of the test of problem solving had its maximum correlation with the grades in physiological chemistry and histology. Both correlations were .20, (Table 2).

TABLE 3. Correlations between the predictive variables and the final total grade (Honor points) for the first year of medicine. Class of 1938. Minnesota tests given in January, 1935. Number of cases 129-136.

Minnesota Tests	Final total grade (Freshman Honor Points)
1. Comprehension and Retention	.08
2. Classification by Outline	.18
3. Relevancy	.29
4. Inconsistencies	.10
5. Problem Solving	.36
6. Science Survey	.24
Total 1-5	.33
Total 1-6	.33
Moss Aptitude Test	.27
Premedical H.P.R.	.57

The problem solving test was constructed with the express intention of subjecting the student to a task comparable to that which he would meet both in learning physiological chemistry and in applying his information to clinical problems. One of the writers, a physiological chemist, wrote condensed accounts of blood chemistry and the acid-base balance. These accounts, of about 400 and 600 words, respectively, contained the facts with which the student was expected to solve problems in practical biochemistry. The problems differed from the usual type of question in that they could not be answered by reference to any single fact or sentence, but require a synthesis of two or more of the facts or statements presented in the condensed expositions. The student was urged to refer constantly to the reading material while working out the solutions to the problems. In the following paragraphs are the instructions, an excerpt of the reading material and one of the problems as they appeared in Battery 1, 1935w.

Directions: Read the following discussion very carefully; then with the information obtained solve the problems given on the following two pages. Refer to the discussion as much as you wish while solving the problem.

During digestion, proteins are broken down to amino acids. These acids are absorbed into the blood stream and carried to the tissues where they are metabolized. The first step in their metabolism is the splitting off of the amino group forming an hydrix acid and ammonia. The ammonia is carried to the liver where it is synthesized into urea. Urea being of no use to the body it is excreted by the kidney. Some other waste products of protein metabolism are sul-

phuric acid, phosphoric acid and uric acid. These are also excreted by the kidney and produce an acid urine.

. . . In certain diets nucleo-protein is present. The amount depends upon the size and number of cell nuclei in the food. This nucleo-protein breaks down into amino acids and also a substance, nucleic acid. In the metabolism of the nucleic acid, phosporic acid and uric acid are formed as waste products. Uric acid is an organic acid containing nitrogen. . . .

Problem 1. The nuclei of liver cells are large and numerous while those of muscle cells are small and less numerous. Equal weights of liver and beefsteak contain about the same amount of nitrogen. A man is eating a constant diet with 200 grams of beefsteak. If he continues to eat this same diet but replaces the beefsteak with 200 grams of liver the amount of nitrogen excreted in the urine per 24 hour period will remain constant, but the following changes will take place:

	increased	decreased	unchanged
1. Uric acid			
2. Ammonia			
3. Urea			

In the third form of this test, the one used in the spring of 1936, only one page of discussion was presented. This exposition covered a single phase of biochemistry. Four problems, each consisting of from six to eight parts, followed the discussion. In addition to indicating his solutions the student was required to give a reason for each of his solutions. Below each problem was a list of from seven to ten reasons from which the student had to choose. In order to make guessing more hazardous, each list of reasons contained one or more entirely inapplicable ones. Furthermore, none of the applicable reasons was satisfactory for more than one solution. (In addition to the 4 problems there was one page of simpler problems.) Forty minutes were allowed the student for the problem solving test in the 1935w battery. The maximum obtainable score in this form was 38. This score was given a weight of two. In the 1935s version the tested was allotted 40 minutes and the maximum score was 38 points. This score was given a weight of two. In the 1936s version the test was allotted 40 minutes and the maximum score was 38 points.

Science Survey. This was essentially a test of ability to apply information gained in science courses to the solution of more or less practical problems. We used it primarily to determine the relative amount of material retained from premedical studies. Though showing relatively low correlations with final grades earned in the various courses of the freshman year, with the exception of physiological chemistry, in Battery 1 1935w (Table 1), this test had high enough correlations with the final grade for the year for two successive classes of freshmen to warrant its continuation (Tables 3 and 4). The coefficient of correlation for the Class of 1938 was .24 and for the Class of 1939, .28. Science survey does not have unfavorably high correlations with the other tests or with the premedical college grades and the Moss test.

Originated by Dr. Palmer O. Johnson of the University Committee on Educational Research and contributed to by S. E. T. Lund of the same committee, the survey consisted of multiple choice and matching questions concerning

applications of principles and facts from physics, inorganic chemistry and biology. In the later edition, questions on astronomy and botany and scientific attitude incorporated in the original version were replaced by a number of questions, furnished by Dr. E. P. Lyon, which were intended to ascertain the student's ability to apply principles and facts of chemistry and physics to problems of physiology.

In the 1935w battery of tests, 60 minutes were granted to the students for the completion of the survey of science. The maximum obtainable score was 195. A time limit of 45 minutes was allotted for this test in the 1935s form

TABLE 4. Correlations between the predictive variables and the final total grade (Honor points) for the first year of medicine. Class of 1939. Minnesota tests given in May, 1935. Number of cases 98.

Minnesota Tests	Final total grade (Freshman Honor Points)
1. Comprehension and Retention	−.02
2. Classification of Terms	.28
3. Classification of Characteristics	−.02
4. Spatial Relations	.13
5. Problem Solving	.24
6. Science Survey	.28
Total 1-5	.12
Total 1-6	.23
Moss Aptitude Test	.22
Premedical H.P.R.	.46

of the Minnesota tests and the greatest possible score was 126 points. Science survey required 40 minutes in the 1936s battery and the maximum obtainable score was 130 points.

Classification of terms. First used in the 1935s, or Battery 2, of the Minnesota tests, this instrument shows promise of being useful. It had a correlation of .28 with the final grade for the year for the Class of 1939. In this respect it equalled or surpassed all of the other measures of aptitude except the premedical college grade (Table 4). It correlated most highly with embryology. The correlation was .26 (Table 2). This test, in unchanged form, was included in the last battery of aptitude tests.

Classification of terms can perhaps best be understood by reading the instruction and a few of the "questions."

> Instructions: There follows a list of groups of terms, five items in each group. In some instances one of the items will be a term which will include the other four. In these cases, underscore the inclusive term thus:
>
> Chair, table, furniture, bed, piano.
>
> In some instances all of the items will be of equal value, and there will be found no inclusive term. In these cases, simply place an X at the end of the line.
>
> Chair, stool, table, bed, piano. X
>
> In some instances one of the items will be so different from the other four that no inclusive grouping is possible. In these cases, circumscribe the item which does not fit, as:
>
> Chair, table, (book,) bed, piano.
>
> Finally, in some groups the items will be wholly unrelated and cannot be

readily classified, in which case underscore all items as:
Chair, bucket, book, coal, soap.

1. Pimple, boil, abscess, furuncle, carbuncle.
15. Reptilia, coelenterata, aves, amphibia, mammalia.
21. Memory, perception, nausea, reason, emotion.
40. Genus, family, species, order, class.

The time allotted for this test was 9 minutes in Battery 2, 1935s, Minnesota test and 12 minutes as it was used in 1936s. The highest possible score was 40 points.

Classification of Characteristics. In this test, used first in Battery 2, it was necessary to arrange and classify, on the basis of one or more common factors, a series of bacteria presented in 25 pictures. This test showed a slight negative correlation of —.02 with the final grade for the first year of study for the Class of 1939. It also had low negative correlations with the average premedical college grade and with the Moss test. Interestingly enough, this test also showed unusually low correlations with the other components of the battery, not exceeding a value of .17 with any of the other sections of Battery 2 (1935s). The test, by reason of its generally low correlations, would seem to be dealing with factors outside our field of interest, despite the fact that in theory it would seem an eminently suitable test for the field of medicine. It was an attempt to approximate the tests of observational powers such as are said to have been applied to prospective students by certain famous teachers of the biological sciences. The instructions that accompanied the test will serve to illustrate the object of the test.

Instructions: On the following page there will be found 25 diagrams illustrating the microscopic characteristics of different sorts of bacteria (in some instances hypothetical bacteria). They may be grouped together according to these microscopic characteristics in a number of different ways. Thus, in the example given on the following page, all of the species which have round cells have been grouped together. Study the diagrams and discover as many other ways as possible in which you can group the organisms. In the column marked "Character" list the character you have selected for the group, as roundness in the example given; in the column marked "Numbers" place in serial order the numbers of the diagrams which exhibit the character you have selected. There are provided more spaces than there are possible characters for classification. Be sure that you include under "Numbers" only the diagrams that you are certain can be classified under the characters that you have discovered. The number of diagrams that you classify incorrectly will be subtracted from the number that you classify correctly.

The student was allowed to spend 15 minutes on this test. The highest possible score was 72 points.

Spatial Relations. This test was intended to be one of ability to shift from one plane of reference in space to a second place of reference in space. We hoped that this test would be analogous to at least one problem involved in the appreciation of anatomical structures, that of proper visualization of serial sections of a tridimensional organism. The instructions presented to the student will serve to describe this test.

Instructions: On the next page are a sagittal section and a series of cross sections of an hypothetical organism. The organism consists essentially of an outer skin (labelled Skin A), an inner skin (labelled Skin B), which fuses with Skin A, a more or less centrally located round tube and a solid rod of small diameter underlying the round tube throughout the entire length of the organism. Both tube and rod rest in the homogeneous substance of the "body cavity" (represented by diagonal hatching). You are to indicate on the sagittal section the exact points from which the cross sections have been obtained. To do this you are to place the number of the cross section directly over that vertical line above the sagittal section that in your estimation most nearly points toward the exact place from which the cross section was obtained. Follow this procedure for each cross section. Cross section number 1 has already been placed as an example of the procedure to be followed.

A longer, but similiar, form of this test was employed in the 1936 testing program but at the present time data are available only on the form employed in Battery 2, 1935s, of aptitude tests. Scores on this test correlated .13 with the final total grade for the first year of medical studies (Table 4). The highest correlation of this test, .26, was with histology (Table 2). However, the foregoing correlations do not tell the whole story, for the test was evolved to provide an hitherto nonexistent means of measuring aptitude in courses in anatomy, which are predominantly of the laboratory type. When the test scores were correlated with grades for laboratory work in embryology, the grades having been largely determined on the basis of practical examinations employing models and slides, a correlational value of .35 resulted. With marks in embryology laboratory the comprehension and retention test correlated only —.03; classification of terms, .22; classification of characteristics, .13; problem solving, .18; science survey, .11; all five tests as a unit, .22; and the Moss test, .08. It would seem that a test of this nature might afford an approach to the solution of a very vexing and very important problem in the field of determining medical aptitudes.

Ten minutes were allotted for completion of the 1935s or Battery 2 form of this test. The maximum possible score was 16 points. The student was allowed 20 minutes for completion of the 1936s form. Twenty-four points could be earned in the second form of the test.

TABLE 5. Reliability coefficients of the tests that composed the University of Minnesota Tests in Medicine, Battery 1, 1935w. Based on scores made by 150 members of Class of 1938. The odd versus even items method was employed for calculating these coefficients.

	Coefficient of Reliability
Comprehension and Retention	.42
Classification by Outline	.93
Relevancy	.73
Inconsistencies	.81
Problem Solving	.85
Science Survey	.90
Whole battery of tests	.92

Reliability of the Tests. In Battery 1, 1935w, the classification test and the survey of science possessed the highest coefficients of reliability, with figures of

.93 and .90, respectively (Table 5). The coefficient of reliability for the entire battery of tests was .92. The coefficients as presented have been corrected for attenuation. If the coefficient of reliability for the battery as a unit is taken at face value, one may assume, regardless of whether or not we were testing aptitudes for the first year of medicine, that if we had repeated the tests with the same group of students under the same conditions, the ranking of the students would have been approximately the same as it was in the first testing.

In Table 6 are presented the coefficients of reliability for Battery 2, 1935s, of the Minnesota tests. Problem solving and science survey had the highest coefficients, .83 and .89 respectively. It was not possible to determine satisfactorily the reliability of the test of classification of characteristics. The reliability of the whole of Battery 2 with the classification test omitted, was also high—.90. So, we may make the same conclusion that we made in regard to the Battery 1, 1935w.

Efficiency of the Minnesota and Moss tests and the Average Premedical Grades in Predicting the Final Grades Earned in the Medical School. In spite of the decreased heterogeneity of those completing two years of work in the medical school in two years, total scores on Battery 1 correlated with marks for two years of work in the medical school equally well as compared to the correlation with the marks of the first year (Tables 3 and 7). Scores on the Moss test on the other hand did not correlate as highly with two years' mark as with the marks of the first year.

TABLE 6. Reliability coefficients of the tests that composed the University of Minnesota Tests in Medicine, Battery 2, 1935s. Based on scores made by 218 applicants for admission to the Class of 1939. Odd versus even items used in calculations. Coefficients have been corrected.

	Coefficient of Reliability
Comprehension and Retention	.32
Classification of Terms	.64
Classification of Characteristics	omitted
Spatial Relations	.79
Problem Solving	.83
Science Survey	.89
Whole battery of tests	.90

The Moss Medical Aptitude Test, unfortunately, does not predict average grades for the first two years of medicine with accuracy greater than the relatively low degree that it shows for either the first or the second years (Tables 3 and 7). At present, we are just as incapable of accounting for this phenomenon as we are incapable of explaining the persistent failure of the Moss test to show the useful predictive values locally that it has shown in many other schools of the country.

The average premedical college grade affords the best means of predicting the grades that a student earns in either the first or second years or the average grade earned in the first two years of medical studies (Tables 3 and 7). It does not, however, become increasingly accurate in prediction as the students progress through the medical curriculum.

The Effectiveness of our Measures of Medical Aptitude in Predicting the Scholastic Success of two Successive Classes of Freshman Students.

All three instruments with which we attempted to predict grades earned in the medical school had lower correlations with the grades earned in the freshman year by the Class of 1939 than with the final grades earned in the same period of study by the previous group, the Class of 1938 (Tables 3 and 4). The respective correlations with the Minnesota tests were .33 and .23. In like manner the Moss test failed to show improvement from one group to the next. The correlations were .27 and .22 for the earlier and later classes of freshmen. The average premedical grade also had less value for the second group. The last correlation was .46 instead of the .57 obtaining for the Class of 1938.

TABLE 7. Class of 1938. Correlations of average final total grades for sophomore year and average final total grades for first two years of medical studies with the three predictive variables. Minnesota tests given in January, 1935. Ninety-five students; those members of the class not taking final comprehensive examinations have not been included.

	Average Medical Grade	
	First Two Years	Sophomore Year
Minnesota Tests	.33	.29
Moss Aptitude	.17	.16
Premedical H.P.R.	.53	.52

The lower correlations found when dealing with the data from the Class of 1939 are interesting by reason of the general nature of the decline from the correlational values observed in dealing with the previous class. Some fluctuations in correlations from group to group are to be expected even when identical tests are employed, but a concomitant decline in the instances of all the predictors is hardly to be expected on the basis of chance alone. There is no reason to believe that any marked difference really exists in prognostication between the premedical college mark of the Class of 1938 and those of the Class of 1939. Two possible reasons for the downward progression of the correlations are differences in the medical school examinations from one year to the next or an increased homogeneity in the Class of 1939, the second of the two groups that we have been considering.

It was not the purpose of this paper to suggest that the University of Minnesota Medical Aptitude Tests used alone furnish a means of accurate prediction of scholastic success in the medical school. It should be quite clear that they will not fulfill that function. It was rather our purpose to indicate certain types of test exercises which do have a greater prophetic value than others and even more than those included in the Moss Medical Aptitude Test.

Two facts are of prime importance in interpreting the data of this paper. In the first place, the coefficients of correlation are based only on cases actually selected for entrance to the Medical School of the University of Minnesota—a relatively homogeneous group. Secondly, the value of the Minnesota Medical Aptitudes, the Moss Medical Aptitude Tests and any such tests is not likely to

be largely in the usefulness in predicting scholastic success when used alone but rather in the degree to which the use of such tests improves prediction by other means. These two points seem to merit further examination.

It is a fact, clearly recognized among statisticians, that coefficients of correlation fluctuate materially with the heterogeneity of the group of cases of which the measurements are taken. The correlation between height and weight of groups of children of the same age is much less than that of a group of children of various ages. The spread in both height and weight of the latter group is greater and the resulting coefficient of correlation between height and weight much greater. There should not be the slightest doubt that if all those who had applied to the University of Minnesota Medical School had been admitted, the coefficients of correlation between marks made in the medical school and each of the various tests would have been materially larger.

The coefficient of correlation between marks made in the medical school and the average mark or honor point ratio made in premedical college courses is usually found to be .50 in schools where reasonably careful selections of entrants has been made. A coefficient of .50 does not indicate that very useful predicitions can be made on the basis of premedical marks alone. The predictive usefulness of any bases for prediction, however, increases more rapidly with each increase of 0.1 in the coefficient of correlation. To be able to provide a supplement to college grade which improved validity of prediction to the point indicated by a coefficient of correlation of .60 would be a distinctly valuable service, particularly when we recall that a coefficient .60 based on the students actually admitted most probably is equivalent to a correlation of from .70 to .80 based on the entire group of applicants. Since the chief purpose of such tests is to select those students who will be admitted from those who apply, rather than to distinguish between those who are admitted, it is the possibility which such tests afford in separating the good prospects from the poor which is important.

Our data show that by combining premedical college grades with Minnesota Medical Aptitude Test Scores as a basis for prediction of scholastic success in the University of Minnesota Medical School, the predictive validity as indicated by a coefficient of correlation is increased to somewhere between .57 and .61.

Study of these tests is being continued. Within a year or two, additional data and conclusions will be presented. Revised forms of the tests have been prepared and given to the applicants for entrance to the Medical School in the spring of 1936 and again in 1937. Results from these groups will be reported and, in addition, data indicating the degree of correlation between these factors and marks made in the entire medical school course.

Philosophical Comments on Examinations*

HOWARD T. KARSNER, M.D.
Institute of Pathology, Western Reserve University School of Medicine
Cleveland, Ohio

APOLOGIUM

Many of the facts about examinations are well known to teachers, but it is difficult to analyze those facts or to synthesize them in a manner that can be designated as truly scientific. Furthermore, some of the facts are observed through a tinted glass, the jaundiced yellow of prejudice or the rose of gentle kindliness, and some are seen through the clear lens of objective detachment. Thus, at the present time it seems necessary and wise to employ the philosophical rather than the strictly scientific line of approach. To paraphrase Lippmann, the views expressed represent an attitude toward examinations "which, when it becomes articulate and explicit, may be dignified as a philosophy." The purpose of this paper is not so much to discuss details of methods as to emphasize anew some aspects of the matter that appear to be of broad interest. The examination has a valuable place in the program of education and training. The teaching staff often looks on examinations as a routine and unpleasant duty rather than as a major function. There are topics related to types of questions, forms of examination, origins and qualifications of the examiner, preparation and attitudes of the candidate, grades and honors, and responsibility of the professional schools to the public, all of which deserve consideration.

ART AND SCIENCE

There is much talk about the personality of the physician and other related qualities that play a part in the practice of medicine. It is suggested by implication at least that these qualities and even those elements which go to make up character can be taught in the medical schools. Indeed, the statement has been made that character and power of expression may be worth more than medical knowledge. It must be agreed, however, that character and personality are inborn and inherent parts of the psyche. They may possibly be modified by environment, cultivated by precept and improved by maturity, but it is doubtful that they can be instilled by teaching. Even though they are intangible and not subject to exact measurement, they should be given appropriate weight in the selection of students of medicine, for they are essential to happiness and usefulness in the practice of the profession. With no underestimate of the significance of character and personality and all that they imply, and with a full appreciation of the wisdom of fostering them during the courses in medicine, it may be said in no uncertain terms that the chief function of the schools of medicine is to teach medicine. This is not the place to discuss methods of teaching, the emphasis on learning rather than teaching, or other technical aspects of the subject,

*Read before the Thirty-third Annual Congress on Medical Education and Licensure, Chicago, Feb. 16, 1937.
Reprinted with the permission of the Journal of the American Medical Association.

but it is the place to emphasize the opinion that schools of medicine have an inescapable duty to provide adequate education for a career of real service. Any suggestion that the art of practice is distinct from the science of medicine is false. Fundamental to that art and essential to it is science. The art without science is form without substance. The schools must safeguard the public. They must maintain ideals and protect principles. They must be able to point with reasonable pride to their product. There are certain ways by which these accomplishments can be determined, but the most conclusive is through the medium of examinations.

AUXILIARIES TO EXAMINATIONS

Certainly, while the student is in the medical school and in more or less close contact with the teaching staff, observations of his work may be helpful in the final evaluation of his merit. The periodic tests, however, are of at least as much, if not more, value to the student in the determination of his own progress, as to the instructor in estimating the acquisition of knowledge and its uses. The fact that a student can remember and utilize information for a week or two is no real guide to his mental equipment or to that permanence of its content which is essential to professional training. In general, those who do well in periodic tests also do well in final examinations and the converse is often true. There are, however, many exceptions and the evaluation of progress on the basis of periodic tests alone is inadequate and unjust.[1] These dogmatic assertions do not exhaust the subject. It is reasonable that all sources should be drawn on for information as to the students' merits. Even in the schools of moderate and small size it is impossible for the department head to know all the students well. The junior members of the staff have an intimacy of contact that is not available to the most genial of professors. In spite of their presumed immaturity and supposedly pitiful lack of experience, the opinion of these junior staff members should be given a considerable weight in the final judgment of the students' ability, even although the wise professor may do so with his tongue in his cheek. Subsequent events may force the professor to place his tongue abruptly in its normal position. All this means that a staff judgment is more to be relied on than an individual judgment.

EXAMINATIONS AS A PART OF INSTRUCTION

A platitude states that we learn by mistakes. It is unfortunate, however, that most human beings must suffer from several mistakes before the lesson is well learned. Another platitude says that anatomy must be forgotten several times (the number seems to vary from generation to generation) before it is learned. If this were true of anatomy, it should be equally true of all other subjects in the curriculum; but as a matter of fact it is true of none. Nevertheless, and perhaps equally platitudinous, it is recognized that there must be many repetitions and the most valuable of these repetitions is that necessary in preparation for a final examination. This applies to factual content in particular, but

1. The problem of the unannounced quiz obtrudes itself here. This is a pedagogic method that may be of value in lower schools but is unworthy of the ideals of a university form of education. It is not in harmony with that academic freedom which should apply to students of university grade as well as to professors.

it is self evident that, as subject matter becomes more firmly implanted in the conscious or even in the subconscious, the capacity to utilize knowledge in logical rational process of thought becomes more ready. Medical education and training are well served by anything that can correlate and coordinate information, integrate it in the student's mind and permit of its proper and appropriate utilization. There is a theory of education, a principle of pedagogy and a science of training, and the final examination belongs to all of these.

This line of reasoning establishes, at least in my mind, the fact that examinations constitute a part of the program of instruction, in addition to the place they must occupy in the determination of the students' capabilities. In their provision for review, repetition and recapitulation by the student, they are like the roof on the house or the capstone on the chimney. (Clichés as to the chimney and the escape of heated air are sedulously repressed.) The house is not complete without the roof, the chimney is not complete without the capstone and the course is not complete without the examination, even although the house is well designed, the chimney well constructed and the course well planned. Roofs and capstones vary in type and so do examinations. It makes no difference to the principle involved whether the examination is oral, written or both. It should, however, be a course examination to be supplemented but not replaced by the comprehensive examination.

COMPREHENSIVE EXAMINATIONS

Comprehensive examinations have now been in operation for a sufficient length of time to permit the conclusion that, as in the colleges, they have a valuable place in the medical schools. The instructor, in his natural enthusiasms for his own subject, is justified in regarding the comprehensive as an auxiliary to the course examination and not a substitute for it. The medical school administrator can safely look on the comprehensive as an examination of great weight in determination of the students' fitness to pass from one stage of his medical education to another, or to graduate. The educator sees that it can correlate knowledge, cover marginal fields, break down bulkheads and test relational thinking and capacity to use information in new situations with a thoroughness far beyond the scope of the course examination. Moore states that, on experimental analysis, the student who works for an examination in the distant future "learns 12 per cent better" than if he works for one in the early future, and that if knowledge rests for a year and then by review is restored to its earlier level "it will become 70 per cent more permanent than if such restoration had never taken place." Whether these figures are accurate or not, the principle cannot be successfully challenged. Its bearing on comprehensive examinations is obvious. Whether the comprehensive examination is called an admitting examination to subsequent courses or a passing examination is of little consequence in this connection. The matter of outside examiners has some bearing but will be referred to subsequently. The members of state boards of medical examiners might well give thought to their function as external examiners as well as to their obligations as protectors of the public. Many

state board examinations savor of this comprehensive quality, but some fail utterly in this respect. Parts I and II of the National Board Examinations serve the educational purposes of the comprehensive review and are satisfactory for the determination of the student's accomplishment. Part III as now conducted, illustrates the best type of correlative test. The same may be said of the qualifying boards of Great Britain and Ireland.

FORMS OF EXAMINATIONS

The phraseology of writers on the subject of examinations includes the terms "essay type" of question and "objective examinations." For the purposes of the medical school the essay type of question includes description, explanation, definition and discussion. Dissatisfaction with these conventional forms of questioning has at times become vociferous. The statistical evidence which the opponents bring forth is based on the wide variation in the grading of papers from a group of high schools by a number of high school teachers. With no disrespect for a fine group of teachers, these results should not be directly applied to graduate professional schools. More to the point, however, is the thought that the blame has been placed on the questions and not on the examiners, on whom it more properly belongs. In the development of education in this country, emphasis has been placed on the teaching function while the examining function has been neglected. When the time comes that the conduct of examinations becomes a major function at least coequal with the teaching function, and this is especially true in professional schools, the value of the "essay" type of question can be more adequately appraised. The objective form of question includes the yes-no, true-false, plus-zero, correct alternative, multiple choice and sentence completion types of short answer. This type of examination has the advantage of an objective grading, uniform and fair, and it can cover a wide scope of knowledge sampling. Jones points out that although questions requiring thought and problem solving may be presented, this is seldom done, that certain types of ability are not measured well if at all, and that students naturally study for this type of question without development of the capacity for expression of ideas, organization and selection of topic, avoidance of duplication and other features required for the essay type of question. What Jones says of college examinations in this respect is applicable to medical school examinations. In a limited experience with the short-answer question, it is found that often a certain amount of subjective grading is necessary. In some of the forms there is danger that a good answer might be the wrong answer.[2] Certain modifications are supposed to give opportunity for reasoning and judgment, but with these and the original forms the questions may readily become riddles to test wit rather than problems to test wisdom.

This part of the discussion may be considered to be too vigorous a defense of the conventional type of examination. It is meant to be a defense but is not

2. The matter suggests the story, almost certainly apocryphal, of the army officer who took an examination for promotion. He was given a tactical problem and after months of study he offered a solution. This solution was not in accord with that worked out previously by the general staff and the officer failed even although his solution in this particular instance was admittedly superior to that of the staff.

to be interpreted to mean that tradition should be the only guide. Novelties in type may well lead the thoughtful examiner to modify his methods in important fashion, without of necessity adopting the new simply because it is new or is believed to be. Fads should not control methods of examination any more than they should be dominant in other activities of sensible people. All credit to those who have proposed different methods, for they prevent the examination from being a time honored changeless form. The suggestions may well alter details of the conventional form, but the evidence does not as yet justify the displacement of its principles. Jones suggests that "perhaps the best type of examination contains such varied questions that students cannot easily predict from year to year the relative importance of different types of questions" and that "enough discussion questions and problems should be presented so that every student is stimulated to prepare broadly."

THE ORAL EXAMINATION

Although a doctor examines his patients, or at least is supposed to, he is constantly under examination by his patients, their relatives and friends. Thus, as a medical student, he is when examined subject to an ordeal no more severe than what will be his lot in later life. He must be ready to meet situations that confront him in school and in practice. It might be contended that since, in practice, his examinations by patients is principally oral, so in school his examinations should be oral. That proposition, however, is obviously superficial, for his diagnosis and management of patients depend on prolonged and thorough study of patients and disease. Thus, his problems in school should permit of careful and painstaking analysis. In this sense the written examination gives opportunity for thoughtful consideration of problems not ordinarily afforded by the oral examination. This is in defense of the written rather than in condemnation of the oral examination. The oral examination most certainly has its place, but it is in no sense superior to the written nor should it be substituted as the only form of examination. If fatigue on the part of the examiner is of significance in the grading of written answers, it must be more so with the grading of the orals. In the former, the examiner can so arrange his work that he is not subject to fatigue, but in the latter a fixed schedule over several days, as is usually the case, may give those whose names are low in the alphabetical list a rougher time than those whose names, like that of Abou ben Adhem, are at the top. Anxiety is an accompaniment of any examination, but the oral is all too likely to add embarrassment as a factor. It is true that the physician must be ready to think and act in the face of anxiety, embarrassment and other emotions, but the way he takes examinations is not always, or of necessity, a guide as to how he will meet the emergencies of a medical career.

In the actual operation of a medical school, it is likely that many of the practical examinations must be oral, but this is not true of all, especially in the so-called preclinical fields. The examiner must exercise his option, but it should be only after the most careful consideration of how best to grade the candidates.

Lest this discussion be thought to be evasive, the opinion is expressed that the written examination is of far more significance than the oral. It is unnecessary to give detailed reasons for the utility of the latter, but none or any would justify the conclusion that it should be the only form of examination.

GRADES AND GRADING

Capacity for organization of an answer and facility in expression undoubtedly play a part in the evaluation of the students' ability. It is claimed that those who lack these powers suffer in comparison with those who have them. That this is unjust in medical examinations is open to question. The practitioner of modern medicine must collect his data, organize them, assign appropriate weight to each observation and arrive at a logical conclusion. The student who organizes his answers well in a professional examination is worthy of a grading superior to that of one who does not. With only rare exceptions, facility of expression is a corollary of precision of thought. The doctor must often act as a teacher in explaining the disease to the patient and in directing treatment. Facility of expression may therefore be regarded as a part of his professional equipment as well as an index of his grasp of information. The examiner must be on his guard not to be deceived by "the well turned phrase" used in shrewdness to conceal ignorance. These comments naturally apply to both oral and written examinations.

The use of grading in examinations deserves especial consideration. A mere distinction between passing and failing[3] may satisfy the poor student, but even the mediocre student is entitled to know how far he escaped the noose. Life is complex and, in our capitalistic system, gives free rein to competition. Survival requires meeting competition and winning. The greater the success, the greater the reward and, more important, the greater the stimulus. Even before his graduation, the medical student is confronted with the problem of securing an internship. Then or later he is also in competition for other professional posts. In the bestowal of these appointments, various factors are considered by the authorities in power, but usually academic grades weigh heavily among the items of merit. In justice to their students and to the institutions which accept them, it would seem that, willy-nilly, the faculties of schools of medicine are obliged to assign grades. This being so, the grades must be built up on as careful and precise appraisal of the student's capabilities as is possible. In some schools the students are "passed" or "passed with honors." In others those who are passed may have grades of A, B, C and D with further subdivisions. In practically all schools these distinctions are based on a decimal system of primary grading. The advantage to professional schools of translating numerical grades to other symbols is obscure to me.

As Link puts it, "the marking system is one of the few definite points at which education resembles the actual world with its systems of incentives and

3. The temptation to insert a footnote is irresistible for, in reading "Round the Fountain" (St. Bartholomew's Hospital, London, 1927), it is observed that, although the British medical student does not use the term "flunk," he has adopted variety of expression in that "plough," "pluck," "spin," "biff" and "bump" are synonyms.

rewards, its mixture of justice and human fallibility." No claim is made that examinations of any type can give an exact evaluation, but they can approximate closely the relative abilities of a group or class. It may well be, as suggested by Blake, that grading should show the actual spread of qualifications rather than be made on the basis of success or failure. This is successful in the hands of the British qualifying boards. Experienced examiners attain the same objective by either method. The differential score of improvement does not meet the purposes of a professional examination and has no place in the final examinations of the medical schools, whether they are course or comprehensive.

CONSTRUCTION OF EXAMINATIONS

The examination must be so constructed in a professional school as to give assurance that the student has acquired the contents and facts of his courses. With a full appreciation of the relativity of truth, especially in the biologic sciences, it is essential that the student have a comprehensive grasp of those facts which at the moment are as true as current methods permit. They constitute the background of his professional activities. The examination should decide whether or not the student has the facts sufficiently in hand to use them logically and with discrimination. This is to be emphasized particularly in the laboratory fields, where there is some danger that mental habit grooves may be established which will interfere with that capacity for the utilization of facts and ability to meet new situations, necessary to success in the clinical fields. The wrong "mental set" may be encouraged by these earlier examinations. They should stimulate the right mental attitude toward facts, their appraisal, weighting, discriminating use and in every possible way encourage relational thinking. The examination should be so set that the candidate of superior attainment can be distinguished from his less talented fellows. This point of view has already been discussed in the consideration of incentives and rewards. The natural conclusion is that if a student is worthy of honors he should have them, and that his opportunity for earning them should be provided by the examiner. In a word, the examination, of whatever form, should determine factual knowledge, ability to use it, and the bestowal of honors.

OUTSIDE EXAMINERS

The employment of "outside" examiners, as practiced in other countries and to a limited extent in this country, is worthy of extension. Jones observes that it broadens the horizon of both teachers and students, promotes the point of view of the outer world, stimulates the students' breadth and independence of thinking, develops intellectual cooperation between instructors and pupils, and tends to raise standards in the colleges. There is little doubt that the National Board of Medical Examiners has exercised these influences and it is probable that certain of the state boards have also been effective. To paraphrase MacNider, it should be recognized that the examination may so reflect the ideals of the thoughtful examiner as to have a beneficial influence on the teaching of his subject in his own and other schools. It would be well if course examinations and the periodic comprehensive examinations in the medical

schools were conducted in this manner and it is to be hoped that it may become economically and academically feasible. The Yale plan of having the laboratory comprehensive examination conducted by the clinical staff is valuable, but it is not really an outside examination because of the close association of the staffs of the two groups in a medical school. It does not meet the need for outside examiners at the end of the clinical years. Other substitutes for outside examiners are less satisfactory. It has been suggested that, when several schools are in proximity, an exchange of examiners, who would be truly external examiners, might prove to be practicable. This function is being capably performed by the National Board in several schools.

THE QUESTIONS

The good question, whether posed by inside or by outside examiners, should collectively cover information, skills and technics, and capacity for thought and expression. Referring to Jones again, it should be of the right degree of difficulty, should be pertinent to important phases of the subject, should challenge and stimulate the candidate, should invite original thought. It should consider adequate sampling of knowledge and should permit ample time for thought and expression, whether oral or written.

The examiner must set his questions with the most scrupulous care as to both the nature and the phrasing of the questions. Clarity is essential. Fairness is imperative. "Trick" questions are inexcusable. Hobbies must be avoided. Questions not germane to the field covered serve to confuse the candidate. The purpose of the examination is to determine professional qualifications, and any departure from that principle avoids the main issue. It is suggested in passing that, while questions on the history of the subject may give a clue to the cultural attainment of the student, they are of no value in estimating his scientific equipment. The examiner must be especially precise in his use of the words discuss, explain, outline, name and define. They all are explicit directions to the candidate and should be considered as such in grading the answers. Technical terms are employed for the sake of brevity, but they should be limited to what might properly be considered as within the student's province at the particular period of his career. The protest against the use of proper names in technical terms is a fetish that can be much overworked. Judgment must be exercised as to what terms may properly be employed, based on the student's presumed familiarity with them. It is ridiculous to direct a student to "read all questions carefully" unless they are written carefully.

THE EXAMINEE

The candidate has his own part to play in the success of the examination. He must not regard the examiner "as a deadly foe, whose very worst is to be expected," but rather as a more or less abstract figure whose sole interest is to determine without prejudice the student's fitness to pass. As is usual and proper, the examination has a time limit. The written examination should have a spatial limit. Proper familiarity with the subject or subjects should enable

the student to give his answers within the prescribed limits of time and space. If the student is given the liberty of a selection of the questions he is to answer, he should choose those to which he can give the best answers as distinguished from those about which he thinks he knows most. In other words, he should study the nature of the directions, because, for example, he may be able to explain something better than he can discuss something else, even though he is more familiar with the topic covered by the latter. After the selection, the student would do well to allocate the time available into appropriate periods for each question. This allocation is to be determined by the time required for thinking over, organizing and writing each answer rather than by allotment of the same amount of time for each. He must do the same for space if that also is limited. He is forced to assume that the questions are carefully worded, even although at times this may strain his credulity. If he is directed to discuss a subject, the discussion should follow a clear plan of definition, nature, causes, effects, manifestations, treatment or prevention such as the problem may require. If he is directed to define, he is not required to, and indeed should not discuss. If directed to give a brief answer, it should not be a diffuse answer. He should expect the examiner to grade him on the exact requirements of the question, and the examiner who does not do so is derelict in his duty. All too often the student interprets such directions as discuss, outline or define to mean "tell all you know about." This is a degradation of the examination and should be so interpreted by the examiner. It is an imposition on the time and good nature of an examiner to expect him to peruse a large volume of material, more or less illegible, in order to glean a few statements directed to the point under consideration. The just examiner grades on the basis of specific answers to specific questions rather than on the basis of the number of words employed. He cannot be blamed if he becomes impatient at diffusion and indirection. He is often possessed of a sense of humor, but it is likely to be sadly warped by attempts to evade an issue. The student also may boast of his humor, but an examination paper is a poor place for its exhibition.[4] The examination of medical students is deeply serious, for it is one of the critical items in the preparation of students for graduation, for the maintenance of the good name of a school and for the protection of the public.

As Murrell puts it, " to the discerning eye nothing is more fascinating than the way in which the mind advances from weakness to power, from vagueness to precision, from halting clumsiness to refined accuracy, from the limited to the embracing point of view." To the teacher in the medical school there is the added pleasure of witnessing advancing earnestness of work, improving deftness of technic, growing objectivity in the study of disease, increasing gentleness at the bedside, expanding sympathy with human frailty and enlarging appreciation of the nobility of a career of service. One of the teacher's great

4. Stephen Leacock intimates that the candidate can take it for granted that the examiner is a conceited, pedantic person, and that "much can be done by sheer illegibility of handwriting, by smearing ink all over the paper and then crumpling it up into a ball." Examiners in the medical schools have it within their power to annihilate this attractive (or, in the mode of the day, intriguing) hypothesis.

joys is to be found when, during and at the end of the medical school apprenticeship, the student passes an examination with credit to his instruction and satisfaction to himself.

EPICRISIS

A thoughtful consideration of examinations has led to the formulation of an opinion that they should constitute an integral part of a well planned program of instruction; that the comprehensive examination offers the advantages of deferred review, the covering of marginal fields and the determination of relational thinking; that the decision as to types of examination shall be reached only after careful survey of all the forms; that the examiner has serious duties in posing questions, in grading and in determination of the relative weight of written and oral examinations, and that the examinee must appreciate the importance and significance of the examination in his professional career. Education is favored by acceptance of examinations as a major function of the teaching staff.

Clinical Teaching in the Outpatient Department

WINTHROP WETHERBEE, JR., M. D.
Junior Visiting Physician, Boston City Hospital
Boston, Massachusetts

INTRODUCTION

The teaching of clinical medicine in outpatient department or dispensary represents a many-sided problem. In recent years especially, a large number of hospitals and medical schools have been faced with unusual handicaps; a great increase in number of clinic patients without corresponding expansion in personnel, a dearth of full time instructors, a lack of adequate space and equipment. These mechanical difficulties are matters of organization, individual problems for each school or hospital, and are, therefore, outside the province of this paper.

One factor worthy of more consideration, however, is the fact that the student who comes to the outpatient department for the first time is frequently inadequately prepared to undertake this type of work. In addition to his training in the basic sciences, he has been given a course in physical diagnosis; he has attended a varying number of lectures in medicine and, perhaps, some clinical demonstrations, and he has done some reading, usually sporadic in character and not following any definite plan. Then, without further training, he is sent to the clinic, where he is expected to meet with a certain amount of confidence and handle with reasonable assurance members of two large groups of people, those who think they are ill (and who may or may not be so), and those who are ill (and who may or may not think so). No attempt has been made, in most of his instruction, to bridge the gap between textbook, laboratory and lecture hall, on the one hand, and human beings, with or without disease, on the other.

A series of talks or informal lectures, given to small groups of students before they commence their clinic work, or during the first few days of that period, is of value in helping them orient themselves, helping them avoid some of the many pitfalls which lie before them, and making them as promptly as possible an asset to the clinic as temporary members of its personnel.

Material which has been found valuable for such talks, or for presentation (with modifications for individual clinics) in mimeographed form as an "Outpatient Handbook," is contained in the following pages.

GENERAL CONSIDERATIONS

I. Outpatient work is as important as any branch of medical training, and one which calls for the highest degree of skill in diagnosis and in treatment. The complaints of the great majority of clinic patients have their origin either in incipient disease, or in functional disorders. It is often extremely difficult for the most experienced clinician to differentiate between these two groups; it is frequently even more difficult to treat either satisfactorily. The student

should not feel that because the bulk of his patients are not obviously or desperately ill, as may be the case with inpatients on the wards, that his responsibilities are any lighter, nor his opportunity for learning any less, than those of his fellow students who are doing ward work. Indeed, in many ways, both are greater.

The student entering the outpatient department for the first time, would do well to remember that there he will lay the foundation stone of his medical knowledge. There he will begin to form habits in medicine which will soon become a part of him, and that there, for the first time, he will begin to develop his powers of observation, his ability to reason medically, and his manner toward his patients. The clinic, in short, represents his first field of opportunity to learn from personal observation not only about disease in relation to human beings, but about human beings in relation to disease.

For three things he should strive constantly: the development of a sound method of diagnostic approach; the accumulation of a store of medical knowledge, however small, to which he shall add something from every patient he sees, and from which, as time goes on, he may be able to draw more and more material to apply to new patients; the cultivation of an attitude toward his patient which will result in the greatest benefit to each. These topics will be dealt with subsequently in more detail.

II. It should not be necessary to emphasize the importance of personal neatness, promptness, courtesy, cooperation, willingness to do extra work when need arises, and the maintenance of a frame of mind receptive to criticism or suggestion. The student will not be in the clinic long before he will realize that he is being judged not only by the physicians over him, but by patients, nurses, clerks and attendants as well. Much of his success, or lack of it, will depend on the impression he makes in his contacts with all of these people. Exhibition of the above mentioned qualities will do him no harm.

III. Much paper work is necessary, aside from the histories written and the physical examinations made (and which, by the way, because they become an integral part of the patient's record, should follow exactly the form prescribed by the clinic). He will be called on to write prescriptions, to fill out various forms and requisitions ordering roentgenograms, electrocardiograms, blood studies, transfers and the like. If his handwriting is not legible, he will be a nuisance.

IV. Before he comes to the clinic, the student should learn how to write a prescription. He will not only make things easier for his superior, but he will also impress him favorably if, when the latter tells him, for instance, to give a patient a prescription for 15 grains of acetylsalicylic acid, to be taken three times daily with a little soda, he can do so without having to ask questions. Incidentally, nothing should ever be prescribed for a patient without there being made in the record a careful note as to exactly what it is and how it is to be taken. This will save much subsequent trouble.

V. The student should never neglect taking a specimen of blood for Wassermann, Kahn, Hinton, or whatever similar test is employed in the clinic. This should be done on every patient seen, whether or not there seems to be any indication for it. The best indication is that 10 per cent of tests, more or less, will be returned positive. "The most serious disease that afflicts humanity . . . like the iceberg, moves nine-tenths below the surface, and only one-tenth above it."

As early as possible, the student should familiarize himself with the technique of taking blood. Many students leave in their wake a trail of broken syringes, plugged needles, antecubital-space hematomas, and blood-stained linen; this stigmatizes them as careless workers.

VI. It should be remembered that however well grounded the student may be in theoretical medicine, he is lacking in experience, and, threfore, in clinical judgment. Indeed, nurses who have been in the clinic for many years may be better diagnosticians than are junior students. The nurses may not know many of the things which students have been taught in the medical school, but their experience has been greater; they can, usually, tell at a glance whether or not a patient is very sick, and sometimes whether he has tuberculosis or cancer of the stomach. Students can learn much by combining their own theoretical knowledge with the observations of more experienced individuals.

VII. The student should remember always that his patients are not attending a public clinic from choice, but, for the most part at least, because they cannot afford to visit a private physician. He should treat them with no less consideration because they are objects of charity; his reward will come not only from developing a pleasant manner which will stand him in good stead with his own private patients in years to come, but also from the fact that dignity on his part, and evidence of a proper regard for their feelings, will win for him greater confidence and respect, and with it a higher degree of cooperation on their part.

He should look ahead, and realize that if in private practice he leaves a patient dissatisfied, that patient probably will not return. If a young doctor cannot make a habit of trying to please his patients, and learn to do so in some degree at least, although his medical knowledge may be encyclopedic, he will never attract or hold patients of his own. In his outpatient work, keeping this in mind, and governing his actions accordingly, will stand him in good stead in future years.

When one has a patient who is not over-intelligent and who may be further handicapped by language difficulties, or by bewilderment at new and strange surroundings, he should learn not to shout at him in a misguided attempt to make himself more easily understood. He will only add to the patient's confusion if he raises his voice. If he speaks gently and slowly he will accomplish more, and without becoming hoarse or annoying his colleague who is trying to hear a murmur in the next room.

Also, it should be remembered that one cannot be too elementary when

he is talking to a patient, explaining to him the nature of his ailment, or how he is to take his medicine, or what he should know in some other respect. Many patients who nod their heads and say "Yes, doctor" in apparently perfect agreement and understanding will subsequently be found to have comprehended nothing. The student should make certain that the patient understands what he is told, whatever it may be.

On the other hand, it is common to underestimate the intelligence of patients, especially when diagnosis or prognosis is being discussed in their presence. When he talks with other students, or with the visiting physician, the student is prone to forget that the patient who is lying on the examining table is straining to hear every word that is said. If he is careless in using certain words or phrases—"malignancy," "acid-fast," "poor prognosis," or their equivalents, for instance—unwittingly, he may be telling the patient more than is desirable, and may cause unnecessary and harmful apprehension by so doing.

VIII. The student should take a personal interest in each patient; he should try to see his problems from the patient's viewpoint, and to make him feel that that they are his own concern. His interest, however, should never be manifested by familiarity. Medically, it is bad form, for instance, to call patients in the clinic by their first names, or by nicknames; it is worse to address them, as is so often done by well intentioned but unthinking interns, by epithets such as "Pop," or "Grandma." In short, the student will exhibit, as well as receive, the greatest degree of respect, by keeping his interest in the patient on a strictly professional basis. This applies particularly to patients of his own age and of the opposite sex.

IX. The student should not be afraid to ask questions. He is in the clinic to learn; the contacts which he has there with older physicians are the nearest he ever may have to what is perhaps the ideal educational system, that of master and apprentice. One of the finest traditions in medicine is that of the physician's obligation to impart to his successors whatever he may have of medical knowledge. He is best able to exemplify this in his association with patients in the clinic, and if reasonable tact is used by the student in regard to the time and occasion, he will not be found wanting.

X. The student should not lose track of any patient he sees.

If the patient is admitted to the hospital, he should make it an unvarying rule to follow his progress there, either through personal observation, or through the hospital records.

If the patient is given an appointment to return to the clinic, the student either should see him at that time, or find out later, from his record, what happened.

If a roentgenogram or other study is ordered, he should find out what was revealed. He should see every electrocardiogram, blood smear, or other laboratory procedure which has been ordered. The knowledge gained in his special courses in roentgenogram and electrocardiogram interpretation, in hematology

and in clinical pathology will be wasted if he does not apply it to patients he actually sees, and if he does not learn to evaluate the relative importance of these procedures as adjuncts to clinical observation.

By following patients thus, he will accomplish three things. He will have his original impressions confirmed or discountenanced, thus enabling him to proceed with assurance, or profit from mistakes. He will check his own findings against those of the laboratory, and thus help establish his personal margin of error in judgment and in physical diagnosis. And, finally, he will learn something of the progress of disease processes.

XI. In this latter connection, it is never too soon for the student to start attempting to gain some knowledge concerning the natural history of disease.

A few men in each medical generation have emphasized the importance of regarding disease not as a static phenomenon, but as one which has its beginnings and its ends, which progresses through interdependent stages manifesting itself in a wide variety of ways, and which should be studied and treated not as something existing merely in the present, but with a view to determining whence it came and whither it may go.

Take, for instance, a case of syphilitic aortitis. Its origin was in a primary infection, acquired, perhaps, twenty years previously. Its present state may be nothing but a widened aorta, found on routine physical examination. Its future may be aneurysm formation with the symptomatology characteristic of this condition; coronary disease with another set of symptoms and signs, or aortic insufficiency with still a third group of manifestations.

Similarly, hypertension offers another excellent example for the application of this viewpoint. Its present state may be evidenced only by the sphygmomanometer; its past, in many instances, is not ascertainable; its future, will take one (or more) of three roads, cardiac, renal or cerebral, each condition with its own signs and symptoms.

The student, then, should not think of the condition merely as it is, but take a broader outlook, attempting to ascertain the past and determine the future. Dr. Mackenzie insisted on this viewpoint; so, in our generation, does Dr. Moscheowitz. These two are, perhaps, its two most outstanding exponents. The attitude which the latter has characterized as "a biologic concept of disease" is of most particular application in outpatient work, as it is in the clinic that patients are seen in the beginnings of their illnesses, relatively speaking. Treatment is often of value in preventing or delaying progress of the disease; complications may be anticipated, and although diagnosis is more difficult there than during later stages, results of treatment are far more satisfactory.

XII. Finally, the importance of doing a large amount of specific and general reading while the student is on the outpatient service cannot be over-emphasized. Because, to a certain extent, the student has graduated from classroom, laboratory and lecture hall, and reached the stage where he deals personally with patients, he should not consider himself entitled to forsake his library. He should use it more. The sagacious Osler once remarked that

"To study the phenomena of disease without books is to sail an uncharted sea." This is more applicable to early outpatient work than to any other aspect of medical training.

From his preclinical lectures and reading the student has become more or less familiar with the textbook pictures of some of the more common diseases; this essential academic knowledge is only the very beginning. In practice, he will soon discover that the clinical entities which have been described to him, and the accurate descriptions of disease which he has read in the textbooks, fit few, if any, of the patients he sees. A "textbook picture" of any disease is a relatively rare clinical finding. The student should note every variation which comes to his attention. The most puzzling cases usually turn out to be ones which exhibit abnormal or unusual manifestations of common ailment. Each night he should read in a standard textbook of medicine the description of the illness or illnesses he has seen that day in the clinic. He should note which of the described features were present, which absent, and what unusual or abnormal aspects he found. If, as he should, he has also a textbook on differential diagnosis, he should look up in this the chief symptoms which his patient presented; see which possibilities he considered, which he overlooked. In his physical diagnosis, he should read the sections which apply to the physical findings. In short, he should go over every aspect of his case until he is satisfied not only that he has made the correct diagnosis, but that he can substantiate it in every respect. This is "required" reading, and should take precedence over everything else. If a student does not do it, he is wasting his time; if he does not do it while the case is fresh in his mind, most of its value is lost.

As the student reads, one thing will lead to another. The more he learns about a specific subject, the more interested he will become. He will want to look up references to original work; he will be interested in reading pioneer descriptions of individual diseases (such as have recently become available through Dr. Major's book, for instance), he will read papers on related subjects in the current literature. It will surprise him to see how soon he accumulates a respectable amount of working knowledge, fixed well in his mind, and ready to apply to new patients.

SOME HINTS ON DIAGNOSIS

This section is not intended to serve as a text on diagnosis. Rather, its aim is, first, the presentation of some general diagnostic principles with which younger students are frequently unfamiliar, and second, the calling to their attention of certain common sources of diagnostic error encountered in their clinic work.

"All symptoms and signs must be compatible with the diagnosis reached.

When subjective and objective symptoms apparently conflict, the latter should be given greater weight.

A diagnosis of a single disease is more likely to be correct than a diagnosis of more than one disease.

When two diagnostic possibilities present, the chances favor the commoner of the two diseases.

Diagnoses reached by exclusion are dangerous.

Once the diagnosis is made, do not change it without very cogent reasons." (Blumer)

"In the diagnosis of a given disease, it is essential that the physician rest his opinion not upon one or two symptoms, but upon a series of symptoms which when properly put together give him a complete, or nearly a complete, picture of the malady. It is as futile for a physician to attempt to base a diagnosis on a single symptom as for an architect to attempt to determine the appearance of a house by seeing one of the stones which has been removed from its walls." (Hare)

"The necessity for the clear differentiation of symptoms:

(a) On the basis of mechanism of production.

(b) On the bearing they have on the patient's future.

The necessity for the classification of symptoms:

(a) On the basis of structure (anatomical changes).

(b) On the basis of function (efficiency impairment, and cause).

(c) On the basis of reflex action (discovery of the seat of disturbance, of the causative agent, and of the function of the nervous system).

The employment of the recognition of a new fact as a foothold for further advance (the law of progression).

The search for other symptoms (the law of associated phenomena) and the recognition of these in their prognostic significance." (Mackenzie)

The above conceptions are of primary importance; they are generalities which frequently have not come to the attention of the student before he takes up his clinical work; they are fundamental considerations which he should always keep in mind.

CLINICAL MAXIMS IMPORTANT FOR THE STUDENT TO REMEMBER

The following paragraphs, more specific in character, are presented not because they represent any original contribution to medical knowledge, but because each has its origin in some error made time after time by students new to the clinic. The statements which they contain are not to be taken as being 100 per cent correct in every instance,—medical axioms, more than any others, are subject to exceptions. Particularly, it should be emphasized at this point that there are no "short cuts" in medicine, especially when diagnosis is being considered. The foundation stone for every diagnosis is a careful and thorough history, and an equally painstaking physical examination. With this understood, they are offered without further apology.

1. The student will not be in the clinic long before he will have a patient in whom he suspects arthritis, let us say, or phthisis, or possibly ulcer of the stomach. He will order a roentgenogram to confirm his suspicions. The report will come back "negative," yet the patient will still have symptoms or signs. There should always be kept in mind the lag which frequently exists, between clinical diagnosis and X-ray confirmation. It should never be forgotten in suspected malignancy. For instance, if the patient presents a clinical picture which suggests cancer of the stomach, a negative roentgenogram should not be permitted to exclude this diagnosis; a subsequent picture, after the lesion has developed, may confirm it. In other words, diagnosis should be based on clinical evidence; the X-ray should be used to confirm it, seldom, or never, to establish it.

2. When a patient presents himself with a story of having had agonizing aches and pains over a long period of time, it may reasonably be inferred that he is probably not very ill. If, on the other hand, he states that he "hasn't been feeling so well lately," the student should be on his guard. The patient is probably beginning to be sick. With increasing experience, the judgment of the student will become very good in these cases. In this connection, one should never fail, at some point during the history taking or the examination, to ask the patient clearly and directly whether or not he really "feels sick." From the manner in which this question is answered, as much as from the actual expressions used, he may form a very accurate idea as to the amount of disease actually present. Especially, he should try to evaluate each patient's individual sensitivity to pain. It will help him to discover not only what kind of disease the patient has, but also what kind of patient the disease has, and the effect each will have on the other.

3. The most difficult of all diagnoses is that of "No disease." When one makes it, he is excluding a great many possibilities. If he tries to avoid it by using the terms "neurosis" or "neurasthenia," he usually is asking for trouble. These are words to avoid, and the wiser and more experienced the student becomes, the less occasion he will have to use them. In the records of any clinic there are countless case reports of patients whose complaints were given such a label at first, only to have it changed later, and in many cases, too much later, to a diagnosis of some organic disease. To be avoided also are vague and loose terms such as "indigestion," "neuritis," "neuralgia," "grippe," "dyspepsia," "gastritis," "lumbago," "chronic appendicitis," and the like. In the first place, they mean little in themselves; second, as the patients make subsequent visits to the clinic, they will usually have to be changed to more definite and exact diagnoses as signs and symptoms of the true underlying cause become obvious and unmistakable.

4. The student should learn something about disease in relation to physical make-up and constitution. As far back as Plato will be found the conception. "And I said of medicine, that this is an art which considers the constitution of the patient, and has principles of action and reasons in each case." Two generations ago, Paget wrote: "I am sure of this: that as the justly successful members of our profession grow older and probably wiser, they more and more guide themselves by the study of their patient's constitution, learning more of family histories, and detecting constitutional disease more skillfully in signs which to others seem trivial." In our own time, the writings of Draper have done much to bring about a renewal of the realization that certain physical types of patients are prone to develop particular illnesses. A recognition of this fact, and some knowledge as to the main diatheses, to use a word popular in previous generations, has a particularly important application to clinic work. The student should remember, however, that possession of the diathesis does not necessarily imply affliction with the disease.

Time after time, students make the diagnosis of peptic ulcer in an obese woman of 40, with a wide costal angle, merely because she has abdominal pain

after meals, which is relieved by soda; similarly, they diagnosticate gallbladder disease in slender young men with narrow costal angles because they have pain in the right upper quadrant aggravated by the taking of fatty foods and radiating to back and shoulder. There is a gallbladder diathesis, and there is an ulcer diathesis.

Too, there is a type of young woman who usually is entered on the records as a case of "neurosis." She is slender, visceroptotic, constipated and anemic; she complains of headaches, lassitude, dysmenorrhea and lack of appetite. She is often neurotic in fact, but what is unrecognized is that this is the result rather than the cause of her complaints. The same holds true of the woman who is going through the "change of life." Members of each of these groups, however neurotic they may be, have definite organic pathology as the basis for their complaints.

There is alleged to be a "rheumatic fever diathesis," characterized by the occurrence, in children, of red hair, blue eyes and freckles. Quite a few children answer this description but who do not have rheumatism, although they may be candidates for it. There are considerably fewer, however, who have long eyelashes, bluish scleræ, winged scapulæ and abnormal growth of hair along their spines, who are not actually consumptive.

5. If a patient comes in complaining of, or exhibiting a generalized tremor, most marked, perhaps, in tongue, lips and hands, one should not make a diagnosis of some rare and exotic neurological condition without thinking first of the common possibilities. In this case, chronic alcoholism would be the first consideration, and an attempt made to substantiate it by eliciting a history of insomnia, gastrointestinal disturbances (often "morning sickness") and anorexia. Sometimes, the patient will help by admitting chronic abuse of alcoholic drinks.

The above brings up the problem of the incidence of disease. From the chief complaint in such a case, statistics would favor the diagnosis given; the diagnosis should not be made for this reason, but from confirmatory findings in the history and physical examination. If the latter do not corroborate the first impression, other diagnostic possibilities should be sought for.

6. Inexperienced students are prone to forget that the region in which a patient complains of pain may not be the one in which his pathology is located. For instance, pain at the angle of the right scapula is common in gallbladder disease; pain in the left shoulder in coronary disorders, and pain in the lower back in duodenal ulcer. The problem of referred pain is still little understood in many of its aspects, but it is a safe rule for the student to remember, that the site of the patient's pain is very often not the site of his disease.

7. Abdominal pain severe enough to cause a man to writhe about in bed or on the floor, and disappearing to leave a practically negative physical examination the next morning, is due to renal calculus even though the urine report may come back from the laboratory as "negative." It was Mackenzie who wrote that "no apparatus can ever replace the trained finger." No laboratory procedure should ever be given greater weight than the clinical picture as seen by a

trained observer. If it is confirmatory, well and good; if not, the clinical findings should be given greater weight.

As a corollary to the above, it should be borne in mind that if the patient presents the clinical picture of gallbladder disease, for instance, or of duodenal ulcer, there is often little point in ordering a Graham test or a gastrointestinal X-ray series. If the X-ray should confirm the clinical diagnosis, the physician will know little more than he did before; if it does not, he will seldom change his clinical diagnosis for this reason; in either event, the patient will have been subjected to a procedure that is often unnecessary as well as uncomfortable.

8. The student should hesitate to make the diagnosis of aneurysm in a patient past 60. The literature gives instances of its occurrences in people older than this; for practical purposes it should be considered a disease of middle life.

9. As to angina pectoris. The student is prone to consider this term a diagnosis in itself, and not to consider etiologic factors. A very distinguished clinician once taught that "angina occurring in a patient under 42 or 43 is invariably due to syphilis." If the patient complains of substernal oppression and paroxysmal dyspnea, with or without angina, he will also usually be found to have syphilitic heart disease.

10. The student should not be content with a diagnosis of "secondary" or "hypochromic" anemia. He should try to find something causing it, especially hemorrhage of one kind or another. Particularly, chronic renal disease, or, in elderly or middle aged patients, a new growth, should be considered. The early and marked anemia accompanying right sided large bowel malignancy is noteworthy.

11. Because a patient has enlarged non-tender inguinal nodes, it should not be assumed that he has had a chancre, especially if he denies this. The most common cause is not syphilis, but epidermophytosis of the feet.

12. The presence of diabetes is to be suspected in arteriosclerotics who have a pink and white complexion, especially if there is a peculiar grayish-brown discoloration in their hair, moustache or beard.

13. The student should never forget the possibility of early catarrhal jaundice in a young patient who "feels rotten," has an entirely negative history, and a negative physical examination, except for a slow pulse.

14. Weight loss, anorexia, pallor, a rapid pulse and a slight rise in temperature commonly herald the onset of activity on the part of an acid-fast process. Malignancy will often give the same picture. The student should never diagnosticate the one without thinking of the other. In young patients, he should also consider hyperthyroidism.

15. When a patient complains of constipation alternating with diarrhea, the student should consider, especially, four possibilities: Cancer of the large bowel, intestinal tuberculosis, dysentery and "colitis." The last named often has a psychogenic origin.

16. The patient with absent knee jerks, shooting pains in the legs, and perforating ulcer of the foot may have tabes; he may also be a diabetic. The

state of the pupillary reflexes may furnish the clue as to which disease is present.

17. If a patient has pain in the chest, worse on breathing, the chances are all in favor of his having pleurisy. Merely because one does not hear a friction rub, he should not call it intercostal neuralgia, herpes zoster, myalgia or muscle strain.

18. It has long been axiomatic in medicine that "when a patient complains of his stomach,—think of his heart; when he complains of his heart,—think of his stomach." This is particularly applicable if he states that he has had a terrifically severe attack of acute indigestion. If the patient is a woman, her gallbladder may be diseased. To most lay individuals, by the way, the word "stomach" seems to be synonymous with "abdomen."

19. The student should not be satisfied with a diagnosis of constipation, especially in people in middle or later life. He should do everything he can think of to exclude malignancy, the more so if the constipation is of recent origin.

20. In the case of a young adult who has lost much weight, the first thought is the possibility of tuberculosis being present. There are three other good considerations, diabetes, Grave's disease and not getting enough to eat.

21. The student should keep constantly in mind what Dr. Osler said concerning *lues venerea*: "Know syphilis in all its manifestations, and all things clinical will be added unto you."

22. The student should not make a diagnosis of cancer of the parotid until he has excluded mumps as a possibility. Incidentally, if the patient is a child, and the mother says it has mumps, or measles, or chickenpox, or whooping cough, he should be very hesitant about disagreeing with her. If it is the grandmother who says this, you can put your name to the diagnosis.

23. The possibility of symptoms being caused by medicines should not be overlooked. The patient may have taken them through prescription by a physician, on the advice of a drug clerk, or on his own initiative.

24. Once in his medical lifetime the student may cover himself with glory by making the diagnosis of polyp of the stomach on the basis of gastric symptoms, tarry stools, marked anemia and no cachexia. This is a brilliant *coup*, but it should not be attempted too often.

25. If an old man has bilateral sciatica, he probably has cancer of the prostate. Even when unilateral, "sciatica" is a poor diagnosis. It signifies a disease which does not exist. One should think of arthritis of the hip, flat feet, sacro-iliac disease, and (in women) pelvic pathology, before making it. Some physicians will not make a diagnosis of "sciatica," but are satisfied with the term "sciatic neuritis;" this is better only provided a cause for the pain is found.

26. An elderly patient with cataract should not be sent to the eye clinic, nor a younger one with furunculosis to the surgical clinic, without having investigated the possibility of diabetes being the underlying cause.

27. The student should not allow himself to be influenced in the slightest degree by what his patient says another doctor told him. If he does, he will be doing the doctor, the patient and himself a gross injustice.

28. The student should pay attention to the occupation of the patient. The lay terms applied to conditions which he will see tell their own story. A few of these are: Painter's colic; stonemason's lung; housemaid's knee; gin-drinker's liver; garageman's headache; brassworker's ague; dressmaker's neck; and soldier's heart. Every student, at some time or another, makes a diagnosis of tuberculosis in the case of an elderly laborer who has a few räles in his chest. The man has swung a pick all his life and has emphysema. Thinking of complaints in relation to occupation will save many similarly embarrassing mistakes.

29. Some thought should be given to race and nationality. Tuberculosis shows a predilection for the Irish; diabetes for Hebrews; venereal disease for Negroes.

30. The student should not let himself be taken in by malingerers. Before long he will meet a patient who will tell him that he has vomited everything he has eaten for weeks. If he finds the patient to have a good moist tongue, no evidence of weight loss, and no evidence of acidosis,—what the patient really wants from him is a statement to the effect that he should not do any heavy work, or that he should not work at all.

He should suspect, also, patients with bizarre or unusual complaints, symptoms for which he cannot find any possible cause, and patients who give histories which constantly contradict themselves, or are incompatible with physical findings. If, during the examination, the patient complains of pain before he possibly could have been hurt; if he forgets the pain when his attention is distracted from it, and if he does not confirm its presence by showing dilated pupils, rapid pulse and an appropriate posture, he is trying to deceive the doctor.

31. Hysteria is quite another matter, and the student will see quite a few instances of it. Perhaps, the most common will be the young girl who has been hiccoughing for several weeks, and is not uremic. If one makes the diagnosis of hysteria, he should not consider the patient a malingerer.

32. A "neurotic" is neither malingering nor hysterical. This is the last diagnosis one should make, as it is an exclusion one, and, therefore, particularly dangerous. The student should consider every other possibility, including hypothyroidism, before he makes it. Once the word "neurasthenia" gets on the patient's record, he ceases to be of interest to most members of the clinic; if he should actually have, or should develop any organic disease, it will not be recognized as such for a long time.

33. In making a physical examination, many students omit several of the most important procedures, either through inherent inertia, or because no one has stressed the necessity for carrying them out. Through these omissions, students often fall into diagnostic errors which are, or should be, entirely avoidable.

The student should not be content merely to determine by percussion the heart borders, the extent of diaphragmatic excursion, and the edge of the liver. He should indicate their positions with a skin pencil. (A soft lead pencil, or an eyebrow pencil, are satisfactory for this purpose, and an excellent investment).

He should examine the eyegrounds of each patient. He will never recognize any abnormal physical findings until he is thoroughly familiar with the normal ones. This is particularly true in examining with the ophthalmoscope.

He should look at every tongue. It will not only tell him something about his patient's constitutional state, but in many cases, by showing papillary atrophy, deviation from the midline, tremor, changes in size, or specific lesions, will give him a clue to the actual diagnosis.

He should palpate carefully every female breast in patients of middle age or older. (This should be done with the flat of the hand, not by feeling between finger and thumb). If he makes this a routine procedure, it will not be long before he finds a breast with a mass in it which the patient herself has not noticed.

On the slightest indication, or without it in male patients, he should make a digital rectal examination.

In short, the physical examination should be as thorough as possible in every respect. The slightest abnormality, even an apparently trivial deviation from the normal, may supply the student with the clue for which he has been searching, and which will serve as a lead to follow in establishing the final diagnosis.

34. The student should try to cultivate all of his senses, especially his powers of observation, to the utmost. There are many abnormal conditions presenting definite diagnostic inferences which he should be able to recognize at a glance, and which he should note as he enters the room, or sees his patient walk up the corridor. Dr. Corrigan once said that "the trouble with most doctors is, not that they do not know enough, but that they do not see enough." Observation is not all, however; the observed signs must be coordinated and integrated for establishment of the diagnosis.

It is not an uncommon thing for a student to spend an hour and a half carefully examining a patient who complains of a painful arm, for instance, and not arrive at a definite diagnosis; another student or physician may enter the examining room, note with his first breath an odor of acetone in the air, and make a correct diagnosis of diabetic neuritis. This is a good example of what Dr. Peabody may have had in mind when he wrote "In the hospital, one gets into the habit of using the oil immersion lens instead of the low power, and focusses too intently on the centre of the field."

CONDITIONS RECOGNIZABLE AT A GLANCE

Of the many conditions which the student will see frequently, and which, through experience and careful observation he should train himself to recognize at a glance, a few are mentioned below.

Most obvious perhaps, are the staring eyes, enlarged thyroid, fine tremor and over-activity of patients with Grave's disease. In myxedema, he will note the dull facies, with thick skin, coarse dry hair, slow speech, large tongue and general lethargy. He should learn to recognize also Parkinsonism, with its

masklike facies, pill-rolling tremor, rigidity, and shuffling gait; chronic alcoholism, evidenced by tremor, flushed skin, puffy and bloated complexion, bloodshot eyes, and abnormally alert and over-active response to questions and other stimuli; pregnancy, with its abdominal enlargement and bovine facies.

He should familiarize himself, too, with the facial expression of a child with adenoids, or the appearance of one with congenital syphilis; the pinched nose and mouth breathing of the former, and the pegged teeth, depressed nose and bossed skull of the latter should proclaim the diagnosis to the most distant observer.

He should note the gait of a tabetic, the lemon hue of patients with pernicious anemia, the malar flush of the rheumatic cardiac with mitral stenosis, the edematous eyelids of the nephritic, the nervous twitchings of a child with chorea. He should train his ear to catch the voices of patients with multiple sclerosis, or paresis, or paralysis agitans.

He should do all of these things, but do them, too, with the realization that he is looking for clues, rather than attempting to establish, from a single outstanding sign, an ultimate and irrevocable diagnosis.

TREATMENT

While it does not fall within our present scope to discuss in any detail the specific therapy for the maladies with which the outpatient student will come in contact, it may be worth while to mention a few general principles of treatment, and after this, to merely enumerate the remedies which experience has shown to be of the most value in the greatest number of clinic cases.

Above everything else, the student should remember that it is the duty of the physician not to cure disease, but to take care of sick people. "To cure sometimes, alleviate often, comfort always." There are few, if any, illnesses which the doctor can claim to be able to cure; there are many types of patient which he can claim to be able to treat successfully.

It is fashionable now to speak of the practice of medicine as an art based on a science. The student receives some training in the latter, little or none in the former; it is for mastery of both that he should strive in the clinic. The medical man should never lose sight of the important fact that he is treating the patient just as much as he is the disease. To quote Dr. Peabody again, "One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient."

There should be called to the student's attention, too, another aspect of this matter. Treating patients who are not sick, but who think they are, is as important as treating those who have a real illness, only it is sometimes far more difficult. These are often the patients who are what Dr. Moschcowitz has termed "allergic to life;" they are the ones who are particularly prone to develop actual disease if their imaginary ills are not cared for properly.

If, after completing the history taking and physical examination, as well as any further studies which may have been considered indicated in the particular case, the student is convinced that his patient does not have an organic

illness (and if this opinion is also held by his superior), he should take time out for some real "reassurance." He should not tell the patient abruptly that he is "all right," or that he "may have something wrong with him, but we can't find out what it is." He should sit down with him, and try to tell him what it is all about, no matter how long it takes. He should explain to the patient that he has been examined thoroughly, and that everything possible has been done to find evidence of disease, and that he can honestly be given a clean bill of health. He should tell him that his complaints will not harm him, but that worrying about them will. He should tell him, in short, that it is "up to him" to prove himself bigger than his imaginary ailment. If the student can do this successfully, he will go far. He will also help rid the clinic of some of its many chronic attendees, who come again and again with their fears and their worries, and needlessly, because no one has gone to the time and trouble to reassure them once and for all.

If a patient proves to have a fully developed cancer, or some other incurable condition, one should use a great deal of discretion as to what he will tell him. He will do well to bear in mind Oliver Wendell Holmes' dictum that "the patient has no more right to all the truth than he has to all the medicine in your saddle bag." Hope is a highly valuable therapeutic adjunct, and destroying it is a medical crime. By the same token, there are many other conditions in which it is wise to err on the side of saying too little rather than too much. For instance, it is bad practice to tell patients their blood pressure. One may say it is "normal," or "high," if he will, but he should not give figures. If a patient is told that his pressure is 210 over 120, both he and his informant will regret it later.

While it should never be necessary to tell a direct lie to the patient himself, in every case of serious illness, some relative or close friend, not necessarily the patient, should be informed as to the diagnosis and the probable outcome.

One should not overtreat the patient, as, for instance, by giving him too much medication. It is by no means uncommon to see a patient leaving the clinic with three or four, or more, different prescriptions. As is the case with many clinic patients, he may not be richly endowed with intelligence, and he may be further handicapped by language difficulties and by indigence; he may not be clear in his mind as to how he is to take any one of the medicines; he may be able to buy but one, and this the cheapest rather than the one greatest in therapeutic value; when he returns to the clinic, no one will know what he has taken, nor how much. The student should learn to prescribe one remedy, or at most two; to make certain that the patient understands how he is to take it; to make certain that he is going to be able to procure it.

It should be realized that many patients need, not drugs, but a rearrangement of their way of life. The hypertensives, chronic nephritics, cirrhotics and arthritics, to name but a few, are not candidates for medicaments so much as for attention to their diet, hygiene, rest periods and the like. Their expectation of life, and their enjoyment of it, will depend almost entirely on how well they

can adapt themselves and their daily lives to their disability, rather than on what they can procure at a dispensary or drug store. To many of these it can be pointed out, with success, that the possession of some chronic ailment such as theirs is the best of life insurance, because they will take better care of themselves as a result.

To Dr. Holmes again has been attributed the statement that "the way to live to a ripe old age is to be born with an incurable illness, and then take care of it." Particularly, if one has the responsibility of treating a patient whose personal co-operation is a great factor in controlling the course of the illness, as is the case with diabetics, he should teach him everything he knows about the disease. Every intelligent diabetic, for instance, should be an expert on the subject; those who become such are the ones who live the longest.

If one has a patient with a chronic illness, or one who is convalescent from a severe acute infection, and whom he wishes to have take exercise and yet not overdo it, he may often gauge the limits of his physical capacity by having him increase the amount of his activity up to the point where he begins to feel tired when he wakes in the morning; when he reaches this point, he is doing too much.

It should be realized that much of the illness seen in clinics, particularly in the "borderline cases," has its origin and maintenance in poverty, with resultant poor housing, bad hygiene and inadequate diet. If a patient cannot afford sufficient food, there is little point in giving him medicine. Cod liver oil and iron pills will not help him if he cannot obtain meat, eggs, milk, fruit and fresh vegetables. These patients are candidates for the social service department as much as they are for the doctor.

Finally, some of the limitations of outpatient department treatment should be emphasized. There are patients who, although they may not appear to be acutely or seriously ill, cannot be treated adequately in ambulatory clinics. They require hospital care. There are others who cannot be studied satisfactorily without hospitalization. Among the patients who are automatically candidates for admission to hospital without lingering in the outpatient department, are those who present the following: Jaundice in any degree; enlargement of the spleen; generalized lymphadenopathy; ascites; acetonuria or marked pyuria; choked disks; "pleurisy;" acute nephritis; erysipelas; intestinal parasites; cardiac asthma; active rheumatic fever.

DRUGS USED IN OUTPATIENT CLINIC

The drugs listed below are those prescribed most frequently in the outpatient department. If the student knows the indications for each, the dosage, and how to write prescriptions for them, he will have little trouble with this aspect of therapy.

Acetylsalicylic Acid	Digitalis	Sodium salicylate	Nitroglycerine
Thyroid	Theocin	Rhubard and soda	Phenobarbital
Insulin	Ferrosate	Sodium phosphate	Tr. belladonna
Mineral oil	Ephedrine	Potassium iodide	Amyl nitrite
Elixir iron, quinine and strychnine sulphate			Methenamine

There are but five drugs he will ever need to use in the clinic proper. These are amyl nitrite, epinephrine, glucose, morphine and aromatic spirits of ammonia.

PROGNOSIS

On this subject there is very little to be said here.

Patients who attend the outpatient clinic as a rule have complaints which relate to minor illness, chronic ailments, incipient serious disease and functional disorders. They can usually be given a good prognosis, for the immediate future at least, and the chief interest which they have for the student, from this point of view, is in the determination of what course the disorder may take, and how it may manifest itself as time goes on.

The student should study each case by itself, analyze the favorable and unfavorable features, and make up his mind as to what the future will hold in store for the patient. This is valueless if he does not follow the case, either personally, or through the hospital records, and observe the actual progress of the patient with respect to changes in symptoms, changes in physical findings, changes in response to treatment, and changes in general well being.

APPENDIX I.

The following pages contain a form of history taking and physical examination suitable for use in the outpatient department. In preparing it, the writer has borrowed freely from the standard "Form of Medical History and Physical Examination as adopted by the Boston City Hospital, Peter Bent Brigham Hospital, Massachusetts General Hospital and Massachusetts Memorial Hospitals." (1931).

THE HISTORY

Name—Residence—Age—Sex—S.M.W.D.—Color—Nativity—Occupation.
Name of physician most recently in charge of patient.

CHIEF COMPLAINT: Should consist of a phrase or sentence, preferably in the words of the patient, embodying an answer to the question "Why do you come to the clinic?"

PRESENT ILLNESS: The most important part of an outpatient history. The student should try to record in minute detail an intelligent, logical and sequential story of the development of the patient's illness. He should arrange symptoms chronologically, beginning with the date of onset; then discuss character of onset, symptoms associated with onset, cause as given by patient; next, describe series of events as they have progressed, leading up to patient's entrance to clinic. "What, when, where, how and why" should be borne in mind constantly.

For example,—of a symptom, he should describe abdominal pain in relation to: location; radiation; character (distress, gnawing, dull, colicky, sharp, burning); severity (double up, cry out, morphia); interference with sleep or work; constant, intermittent, or periodic; time, day or night; relation to meals; duration; relieved, aggravated by, or associated with vomiting (amount, character, duration, time), defecation, catamenia, rest, exertion, pressure, heat, cold, food or medication; accompanied by malaise, distress, distension or jaundice.

The P.I. should be ended with a statement about all systems of the body, other than the particular one affected, in relation to the present illness; estimated degree of loss of weight and of strength since onset; an account of previous treatment.

P. I. should occupy at least a full page in the outpatient record. If time limitations necessitate abbreviations, this part of the history should not be shortened, rather one or more of the less important sections.

FAMILY HISTORY: Inquiry about grandparents, parents and siblings, living or dead, for history of familial or hereditary disease. Cancer, diabetes, gout, tuberculosis, hemophilia, hypertension, Bright's disease, etc.

MARITAL: Duration of marriage, health of consort, children, miscarriages.

SOCIAL HISTORY, HABITS, OCCUPATION: May conveniently be grouped together. Consideration of hygienic factors at home and at work, financial condition; daily routine; habits as to tea, coffee, tobacco, alcohol, drugs; recreations; amount and nature of exercise; sleep; effect of illness on occupation.

PAST HISTORY: Birthplace, residencies. History of any previous illness, especially tonsillitis, chorea, rheumatism, pleurisy, scarlet fever and typhoid fever.

Association with tuberculous individuals. Statement as to general health in past, previous hospital or clinic admissions, accidents, operations, or injuries.

REGIONAL HISTORY:

Head: Complaints related to eyes, ears, nose, throat, teeth, sinuses; headaches.

Cardiorespiratory: History of any of the following: chest pain, palpitation, dyspnea, cough, sputum, hemoptysis, night sweats, edema, asthma, weight loss.

Gastrointestinal: Eating habits, appetite, bowels, use of cathartics; nausea, gas, vomiting, hematemesis; distress, colic, icterus, diarrhea, bloody, tarry, or putty colored stools, hemorrhoids.

Genito-Urinary: Dysuria, hematuria, retention or incontinence, frequency, nocturia; history of urethral discharge or genital sore.

Catamenia: Age at onset, date of most recent period, regularity, duration, amount, degree of dysmenorrhea, leucorrhea, menorrhagia or metrorrhagia.

Neuro-Muscular: Temperatment; vertigo, fainting, twitching, spasm, paresthesia, ataxia; girdle, shooting, muscular or joint pains; memory, disposition; character and personality.

THE PHYSICAL EXAMINATION

General appearance, development and nutrition, mental state, temperature, blood pressure, pulse, respiration rate.

HEAD:

Skull: Symmetry, exostoses or irregularities, tenderness.

Scalp: Cleanliness, scars; color, amount, and texture of hair.

Skin: Color, texture, moisture, eruptions, scaling, pigment.

Eyes: Reaction of pupils to light and accommodation; regularity and equality. Nystagmus. Exophthalmos. State of conjunctiva. Glasses. Appearance of retina.

Ears: Gross disturbances in hearing; discharge; tophi; otoscopic examination.

Nose: Deformities, obstruction, discharge.

Mouth: Breath; condition of mucous membrane.

Lips: Color, fissures, ulcerations.

Teeth: Number, condition. Condition of gums.

Tongue: Color, direction of protrusion, size, tremor, mucous patches or other lesions, moisture, coat.

Pharynx: Appearance of tonsils; color of mucous membrane.

NECK:

Thyroid: bruits, thrills, enlargement. Pulsations or engorgement of vessels. Tracheal Tug. Lymphadenopathy.

THORAX: Symmetry, expansion, size and shape. Rate, depth, and character of respirations. Abnormal pulsations. Breasts.

Heart: Position of apex impulse and borders, character and regularity of sounds; murmurs; accentuations or absences of sounds. Percussion, palpation, and auscultation.

Lungs: Palpation, percussion, and auscultation. Degree of diaphragmatic excursion.

ABDOMEN: Development, symmetry, pulsations, visible peristalsis, tenderness, spasm, rigidity, masses, herniae, visceral enlargement, evidence of free fluid, reflexes.

EXTREMITIES: Involuntary movements. Wasting, tremor, clubbing of fingers or toes; nails, joint changes; varicosities; radial pulse; size, rhythm, rate, equality, character of wall; knee jerks; Babinski; Romberg; gait change; edema; cyanosis; palpable dorsalis pedis; abnormalities of sensation.

The above history and physical examination report should be followed by a brief summary, giving the salient features of each; after this, the diagnostic impression of the student, and his signature.

LABORATORY WORK

As a rule, the student will not be called on to do any laboratory work while he is in the clinic, as in most outpatient departments there are technicians for this purpose. He should not consider his case completed, however, until he has either done himself, or obtained from the laboratory, a report on a complete urinalysis and any blood studies that he may consider indicated. Blood counts and smears have to be done in the outpatient laboratory, while specimens for Wassermann test and sugar or NPN content, are usually sent to the hospital proper.

APPENDIX II.

Only in cases where it is specifically indicated should the student take time to do a complete neurological examination. A routine procedure to be followed for this is the following:

CRANIAL NERVES:

I. *Olfactory:*
Subjective—Disturbance of smell.
Objective—Test ability to recognize odor of vanilla, ether, coffee, vinegar.

II. *Optic:*
Subjective—General vision for near or far objects. Difficulty in reading. Glasses?
Objective—Fundi. Hemianopsia as determined by finger tests. Color fields.

III. *Oculomotor:* Subjective—Diplopia.

IV. *Trochlear:* Objective—Squint; movements of external eye muscles; lid-lag;

V. *Abducens:* nystagmus; pupils; reflex to light and accommodation.

VI. *Trigeminus:*
Subjective—Evidence of paraesthesia of face, tongue, and palate.
Objective—Sensory: (Pain, touch temperature) of face, anterior two-thirds of tongue and palate. Test taste with sugar, salt, and acetic acid. Motor: Weakness of temporal or masseter muscles. Deviation of jaw to right or left.

VII. *Facial:* Paralysis of any part of face, scalp, eyelids, lips, cheeks. Nasolabial fold present and equal on both sides.

VIII. *Acoustic:*
Subjective—Tinnitus, whistles, etc.
Objective—Air and bone conduction with tuning fork, watch, etc.

IX. *Glossopharyngeal:* Difficulty in swallowing and articulation. Test taste posterior third of tongue and soft palate.

X. *Vagus:*
Subjective—Vomiting (vagal).
Objective—Pulse: rate and rhythm; Respiration: rate and rhythm; speech: (vocal cords): quality; symmetry of palate.

XI. *Spinal Accessory:* Muscle power—sternocleidomastoid and trapezius; atrophy.
XII. *Hypoglossal:* Motion of tongue; in what line protruded; tremors of tongue.

CEREBRUM

Frontal:

Subjective—Memory. Disposition.
Objective—Habits. Orientation as to time, place, and person.

Temporal:

Aphasia.
Uncinate gyrus attacks, i.e., hallucinations of smell, taste, and dream states.
Hemianopsia—As losing sight of median or lateral part of an object.

Parietal:

Sensory—Paraesthesia; touch, pain, temperature, muscle sense, astereognosis.
Motor—Convulsions, twitchings, intention tremor, weakness or paralysis of different groups of muscles.
Occipital—Hemianopsia (homonymous). Hallucinations of light.

CEREBELLUM

Romberg. If positive, in what direction. Gait. If positive, sways in what direction. Dizziness (vertigo); Nystagmus; Ataxia (finger to nose—finger to finger—heel to heel—toe to toe).
Diadococinesia—(When the capacity is lessened this is called adiadococinesia).

REFLEXES

Superficial: Epigastric, abdominal, cremasteric, plantar, erector spinae.
Deep: Corneal, biceps, triceps, knee jerks, tendo-achilles (ankle clonus), Babinski, Oppenheim, Gordon, Kernig.

VASOMOTOR

Subjective—Hands and feet generally cold?
Objective—Moisture of skin, color changes of skin surface, temperature.

SPHINCTERS

Subjective—Urgency.
Objective—Incontinence.

POSITIVE FINDINGS

Summary of subjective and objective findings.

BIBLIOGRAPHY

The following references are included here because they have been found to be of particular value to students beginning their clinical work, and because there is much in them which is particularly applicable to outpatient work. Furthermore, the majority of junior students are unfamiliar with them, not having had occasion to read them in connection with their preclinical studies. They are intended to supplement, and in no sense to replace, the reading which the student should do in the standard texts on medicine, physical diagnosis, clinical pathology and related subjects.

CHRISTIAN, H. A.: "Expected Lags between Clinical Diagnosis and X-Ray Confirmation." *New England J. Med.*, 213:593 (Sept. 26), 1935.

DRAPER, G.: "Constitution and Disease." *Nelson's Loose-Leaf Encyclopedia of Medicine*, 7:543.

LIBMAN, E.: "Studies in Pain." *Tr. Ass. Am. Phys.*, 44:52, 1929.

MACKENZIE, J.: "Symptoms and Their Interpretation." Shaw and Sons, London.

MAJOR, R. H.: "Classic Descriptions of Disease." C. C. Thomas, Springfield, Illinois.

MOSCHCOWITZ, E.: "A Biologic Concept of Disease." *J.A.M.A.*, 99:714 (Aug. 27), 1932. "The Psychogenic Origin of Organic Disease." *New England J. Med.*, 212:603 (Apr. 4), 1935.

PEABODY, F. W.: "Doctor and Patient." The Macmillan Company, New York.
Also highly recommended for reading in connection with outpatient work are two standard texts with which for some reason students seem to be less familiar than they are with those written by Osler, Cecil and others.

HARE, H. A.: "The Diagnosis of Disease." Lea and Febiger, Philadelphia.

PALFREY, F. W.: "The Art of Medical Treatment." W. B. Saunders Company, Philadelphia.

Some Interesting Data on Medical Students Obtained from the Student Register

FRED C. ZAPFFE
Secretary, Association of American Medical Colleges
Chicago, Illinois

In 1933, a report was published[1] on the accomplishment of 6,547 freshman medical students who attended seventy-nine medical colleges in the United States during the academic year 1932-1933. In 1936, four years later, the four year medical colleges reported that 5,272 students had successfully completed the four years of prescribed work and were graduated, or, in the case of thirteen colleges, will receive the degree of M.D. after having completed one year of internship. The difference between these two totals is 1,275, or 19.9 per cent. However, of these 5,272 graduates, 638 had begun the study of medicine prior to 1932 but failed of promotion. Therefore, they repeated the freshman year in 1932-1933 and were included in the count of 6,457 freshman medical students for that year. Also included in the group of 1936 graduates are 69 students who did not begin the study of medicine until 1933, but by attending courses continuously, they succeeded in completing the prescribed work in 1936, hence are included in the count of 5,272 graduates for that year. Thus, only 3,894 of the 1936 graduates began the study of medicine in 1932 and graduated in 1936, or 30.7 per cent of the 6,457 freshmen reported on at the close of the 1932-1933 academic year.

Continuing the analysis of how students fare—1,431 students of the 1932 group (6,457) have dropped out of medical school—for the time being, at least. None of this group attended medical school after the 1934-1935 session. Some of these began the study of medicine prior to 1932, failed of promotion and finally dropped out completely. Thus, 880 students dropped out at the end of the freshman year; 363 at the end of the sophomore year; 166 at the end of the junior year and 22 at the end of the senior year. Some dropped out after having made a number of failures; some after the first failure. Some students made as many as three attempts to pass the first year and then gave up; some passed one or more years, failed, repeated, failed again and gave up. The register cards for these students have been placed in a "dead" file, which, however, is accessible in case any of them return to medical school to make another attempt to finish the work for the M.D. degree.

Only 18 of the 1932 group died; some during the first year; some during the second year and some during the third year.

In the present (1936-1937) senior class are 742 students who began the study of medicine in 1932 or before, and who may graduate in 1937. Many of these students are repeaters; some interrupted their work for various reasons,

1. Zapffe, Fred C.: Study of Student Accomplishment in Seventy-nine Medical Schools in the United States, J. Assn. Am. M. Colls., 8:381-846 (Nov.), 1933.

sometimes for as many as three years, but whose record has been clear throughout. Some of the cards now in the register date back as far as 1927. All of these 742 students were members of the 1935-1936 junior class.

There remain 66 students who were in medical school during the academic year 1935-1936, but who cannot graduate in 1937. One student may graduate in 1940; 6 in 1939, and 59 in 1938. Nearly all of this group are repeaters.

The register shows that students have been permitted to try as many as three times to pass a single year's work; others have failed at least once in every year or earned one or more conditions and failures in subjects, sometimes many, but managed to gain promotion before the beginning of the next academic year, either by attending summer sessions or by passing examinations. When it is recalled that seventy-seven of these seventy-nine medical schools which are included annually in the study on student accomplishment are approved schools, these data are of great significance and easily lead to the question "Are some medical schools too lenient in the promotion of students?".

This study could easily be carried on further. For example: How many of those students who entered in 1932 and graduated in 1936 had a clear record? How many ranked continuously in the lower third of the class? Should these lower third students be permitted to graduate at the end of four years even if their record is clear, or should they be compelled to take another year to make certain that they merit graduation as persons who should be permitted to practice medicine?

These data inevitably bring up the question of the adequacy of examinations or other means for passing on the qualifications of a candidate for graduation as being sufficient to ensure his becoming a good practitioner of medicine. Are they being passed on to the boards of medical examiners for the final test? The comparatively small number of failures in licensing examinations reported year after year might lead one to presume that these examinations do not eliminate all the unfit. The state board examinations, in most instances being written examinations only, cannot be an adequate test of fitness to practice. The fault is not to be charged against boards of licensure but to the fact that these boards do not have sufficient funds to set up a better examination. After all, it is the duty of medical schools to turn out only those who will become good practitioners of medicine. To that end, better ways of determining that fact should be devised than exist at the present time. The number of graduates would be reduced if only those students whose work was done well during each of the four years in medical school, or whose record was clear throughout, or who ranked in the middle or upper third of the class were graduated. In any event, there is here much food for thought.

Southern Medical Colleges Must Maintain Enrolment at Least at Its Present Level

O. W. HYMAN

Dean, University of Tennessee College of Medicine,
Memphis, Tennessee

In the November, 1936, number of the JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES, Dr. Arthur Dean Bevan, of Chicago, states that the medical profession of the United States is overcrowded grossly and urges that this condition be corrected by reducing enrolments in medical colleges. In the course of his argument, Dr. Bevan charges that many of the medical schools know they are taking more students than they can teach properly and continue to do so on account of the pressure of applicants and the desire of the schools for the applicants' fees. Since he makes this charge without naming schools, it must be treated as an indictment of medical schools in general. Dr. Bevan especially singles out the state universities as "doing a great injury to the people of this country" by graduating too many doctors. These statements are made positively as if they were facts.

During the period 1930-1935, we may assume confidently that greed for students' fees and political and personal pressure of applicants must have operated most powerfully on the authorities of medical colleges. During this same period, enrolment in the medical colleges of the United States increased from 21,982 to 22,564—2.6 per cent (the increase in population was at least 5 per cent). Enrolment in the medical departments of state universities during the same period increased from 7,746 to 7,916—2.2 per cent. These figures are taken from the "educational numbers" of the *Journal of the American Medical Association*.

It seems that such negligible increases in enrolment should be sufficient proof that the medical colleges have not yielded either to greed for fees or to pressure from without. The state university schools, instead of being selected for special castigation, would seem—relatively speaking—to deserve some modest commendation. It appears that Dr. Bevan's charges are not factual but are simply his opinions. They should have been so represented.

Dr. Bevan's indictment of the authorities of medical colleges does not invalidate, necessarily, his general argument that, by raising standards, the medical colleges should reduce their admissions 5 per cent each year for the next five years. This proposal is based on statistics for the whole United States. It does not concern itself with wide discrepancies between conditions in different regions. For many years, I have been associated with a medical college selecting its students from the southern states. I am concerned especially with conditions in this area. These conditions are different from those presented by Dr. Bevan.

In the southern area, I include those states south of the Potomac and Ohio Rivers and Arkansas, Oklahoma, Louisiana and Texas. In this area live

39,000,000 people, about one-third of the population of the United States. In 1936, its ratio of physicians to population was 1 to 1,106. In South Carolina, there were 1,541 persons to every physician, in Alabama 1,361, and in North Carolina 1,346. The figures are all beyond the ratio of 1 to 1,000 desired by Dr. Bevan. (I believe that the ratio 1 to 1,000 is without factual validity and is the result of wishful thinking, being comfortably beyond the ratio 1 to 760.) In contrast with the ratios in southern states, there are only 678 people to each doctor in the New England states and 651 in the Middle Atlantic states. Moreover, while the ratio of physicians has been rising in other areas, in the southern states it has been declining steadily for the past twenty years.

If we examine the distribution of physicians within the southern area, we shall find conditions of which those in Tennessee probably are typical. In Tennessee, the physician-population ratio in 1936 was 1 to 1,004. In the four large cities it was 1 to 500, while in the remainder of the state it was 1 to 1,517. In other words, urban areas are overcrowded and rural areas undermanned (according to Dr. Bevan's standard).

All this, says Dr. Bevan, is a matter of distribution and would not be corrected in some areas if the number of doctors were doubled—thus washing his hands of this major problem. As a matter of fact, there is every bit as much hazard to the public and to the medical profession from scarcity of physicians in certain areas as from overcrowding in others. Those who are alarmed about overcrowding might well address themselves to the problem of distribution instead of harrying the medical colleges. At least some of the medical colleges have achieved notable success in improving distribution.

During the two years intervening between the 1934 and 1936 directories of the American Medical Association, 1840 physicians entered private practice in the South. This number is exclusive of those who entered government service (federal service, public health, teaching). Of the 1840 physicians, 1576 were recent graduates and only 264 migrated into the area. It is probable that an equal number of migrants left the area. At least, it is obvious that, in spite of overcrowding elsewhere, migration into the South is inconsequential. Why do not the surplus doctors from elsewhere move into this area? There are no effective legal barriers.

It is assumed frequently that doctors distribute themselves in proportion to the wealth of various regions. This does seem to be one important factor but I believe that there is a social factor equally important. A young man entering practice wishes to be busy and to be paid well. In addition to practicing medicine in a community, however, he also expects to live there and he is concerned greatly as to whether he will like his neighbors and be liked by them. Will he be able to have a satisfactory home with satisfactory conveniences? Will his wife find agreeable associates and will his children have good opportunities for development? It is not likely that a man raised in Chicago would like to live in a small southern town. During the decade 1924-1933, 624 graduates of the University of Tennessee entered practice. Of these, 439, or 70 per cent, came

to the college from rural communities. Eighty-three per cent of these returned to rural practice. Of the 195 who came to the college from urban centers, 80 per cent returned to urban practice. The South will not get its physicians by migration. Medical colleges in the southern states will train them.

In 1934-1936, 1576 recent graduates entered private practice in the South. Of these, 1250 were graduates of medical colleges in the area—roughly 80 per cent. This high proportion obtains in spite of the fact that Alabama, Florida, Mississippi, and West Virginia do not have complete medical colleges while Arkansas and North Carolina and, probably, Oklahoma and Texas do not have facilities to train as many graduates as are necessary for those states.

A large proportion of the men now practicing in the southern states are over 50 years of age. In Tennessee, 43 per cent of the physicians in cities are over 50; 59 per cent of those in towns (populations 1,000 to 25,000), and 77 per cent of those in villages. If every medical college in the South continues to graduate doctors at its maximum capacity for the next ten years, the number of physicians in the region will still continue to decline. Far from reducing admissions, every one of these colleges should admit as many students as it is able to give good training and should select applicants with thought as to the areas in which they are likely to practice. If the facilities of some colleges are inadequate, the facilities should be improved.

Dr. Bevan proposes that enrolment be reduced by an increase in educational standards and standards of personal fitness without increasing the length of the medical course. If, in the "medical course," the required premedical training is included, I agree heartily that this method should be pursued where reduction is desirable—although the primary purpose is to reduce the number of doctors rather than to improve their quality. Since we do not have a satisfactory method of testing personal fitness objectively, this factor in selection may easily become personal or racial prejudice. The dependable factor will be higher educational standards.

There has been some suggestion that the minimum premedical requirement be advanced from two years to three. It might with better logic be advanced to four. While this will produce applicants with better average cultural training, the extra two years by no means guarantees the acquisition of a cultured mind. The influence on the medical college record is negligible. The effect on the cost of medical education is certain. It is increased substantially. Would it not be better to increase educational standards by requiring higher grades, excellence in some study, leadership in college activities? This would not increase costs.

To keep the cost of medical education as low as possible is not just to favor the "poor boy." High cost definitely exaggerates the faulty distribution of physicians. In urban areas, where physicians now are overcrowded, there are more colleges. There are more who are financially able to take college training. Since graduates definitely tend to remain in their home communities to practice,

to increase the cost of medical education eventually means more physicians in urban areas, increasing the crowding now existing, and less in rural areas, thus exaggerating the tendency to scarcity.

CONCLUSIONS

1. The concentration of doctors in the southern states is now definitely less than 1 to 1,000. On account of the high percentage of those now in practice who are over 50 years of age, this concentration will continue to decline. The region depends on recent graduates as its source of new doctors. Of those now entering practice, 80 per cent are graduates of southern medical colleges. These colleges must maintain their present enrolments.

2. Any advances in entrance requirements should be such as will not increase the cost of medical education. Increased costs exaggerate overcrowding in those areas now crowded and scarcity in other areas.

A Study of Medical School Diplomas

G. Lombard Kelly
Dean, University of Georgia School of Medicine,
and
Janet Newton
Assistant to the Dean
Augusta, Georgia

In 1934, the University of Georgia School of Medicine changed from the Latin to the English form of diploma. After the English form of diploma was used for a short time, the members of the senior class requested that the use of the Latin form of diploma be resumed. Feeling that this was a step backward, we decided to make a study of the diplomas issued by schools of medicine in this country before acquiescing to the wishes of the class.

In order to obtain the necessary information with which to make this study the following questionnaire was sent to all of the four year schools of medicine in the United States:

"A change is contemplated in the form of the diploma used in awarding the degree Doctor of Medicine from the University of Georgia School of Medicine and, before a decision is reached in the matter, I am asking all of the medical schools in the country to give me the information requested on this form. Your cooperation will be appreciated. A stamped and addressed envelope is enclosed for your convenience in replying.

"1. Is the diploma used by your institution in awarding the M.D. degree worded in English or Latin?.....

"2. Please indicate dimensions of diploma.....
Style of lettering.....

"3. Please indicate the titles of the various officials who sign the diploma.
.....
.....

"4. If the fifth or intern year is required by your institution, is any form of certificate awarded upon the completion of the fourth year of the medical curriculum?" .....

Replies were received from all of the 65 schools to whom questionnaires were sent.

From the replies to question No. 1 as to whether the English or Latin form of diploma was used, the following summary has been prepared:

Schools using diplomas worded in English	45
Schools using diplomas worded in Latin	20
	65

Schools using Latin diplomas are:

Connecticut: Yale University School of Medicine.
District of Columbia: Georgetown University School of Medicine; Howard University School of Medicine.
Illinois: Loyola University School of Medicine.
Massachusetts: Boston University School of Medicine; Harvard University Medical School; Tufts College Medical School.
Michigan: University of Michigan Medical School.
Missouri: St. Louis University School of Medicine; Washington University School of Medicine.
Nebraska: Creighton University School of Medicine.
New York: Albany Medical College.
Pennsylvania: Hahnemann Medical College; Jefferson Medical College; Temple University School of Medicine; University of Pennsylvania School of Medicine; Woman's Medical College of Pennsylvania.
Tennessee: Meharry Medical College.
Vermont: University of Vermont College of Medicine.
Wisconsin: Marquette University School of Medicine.

In reply to the second question concerning the dimensions of the diploma and style of lettering, the following data were compiled:

Fifty-two variations as to size. Largest 19½" x 23¾". Smallest 6" x 8".
Thirty-two diplomas 13⅞" x 16⅞" or smaller.
Thirty-three diplomas 13¾" x 17½" or larger.
Greatest number of any one size—4, 8½" x 11".

Lettering:
Thirty-five use Old English either in all or combined with other styles.
Fifteen use Roman either in all or combined with other styles.
Twenty-five use Script either in all or combined with other styles.
Special Lettering: "Text," "Hadriano" Roman, "Special Lettering Embossed," "Engraved." We have interpreted "Plain Lettering" and "Block" as Roman.

The third question asked for information concerning the titles of various officials who sign the diplomas, and from the replies to this question the following summary has been made:

Signatures: The officials who sign the diplomas are designated by 41 different titles and signatures of the following groups are also required by certain schools:

Regents (facsimile signatures engraved)
Heads of Departments
Directors of Major Departments
Professors of Preclinical Departments, and Professors of Medicine, Surgery, Neurology, Psychiatry and Gynecology.

In case of College of Medical Evangelists, Dean of Loma Linda Division, and Dean of Los Angeles Division.

Two schools, Cornell and Vermont, require only 1 signature, that of the President of the University; 19 schools require 2 signatures; 21 schools require 3 signatures; 15 schools require 4 signatures; 3 schools require 5 signatures; 1 school (Michigan) requires the signatures of the heads of departments; 1 school (Georgetown) requires signatures of 2 officials plus directors of major departments; 1 school (Kansas) requires signatures of 3 officials, plus engraved facsimile signatures of regents; 1 school (Albany) requires signatures of 3 officials plus professors of preclinical departments, and professors of medicine, surgery, neurology, psychiatry and gynecology; 1 school (Hahnemann) requires signatures of 3 officials plus heads of departments.

Forty-six schools require signature of president of university; 47 schools require signature of dean of school of medicine; 14 schools require signature of president of board of trustees; 15 schools require signature of secretary of board of trustees.

In the 13 schools requiring the fifth or intern year, a certificate is awarded at the end of the fourth year by 4 schools, and no certificate is awarded by 3 schools, the diploma being awarded at the completion of the fifth year. In 5 schools the bachelor of medicine degree is awarded at the end of the fourth year and the diploma in medicine at the end of the fifth year. One school awards a certificate at the end of the fourth year and the degree of doctor of medicine only after two years of satisfactory hospital training.

The result of this study indicates that the English form of diploma seems to be superseding the old style Latin diploma. Just how fast this change is taking place we are unable to conclude, but it seems probable that eventually almost all the medical schools will award the English form of diploma.

The large number of variations in size is rather remarkable since in 65 schools there are 51 different sizes. The variation between the smallest (6″ x 8″) and the largest (19½″ x 23¾″) is noteworthy. It is also worthy of note that the greatest number of any one size was of the 8½″ x 11″ diploma, issued by 4 schools.

From the summary concerning lettering and signatures, it can be seen that there is a wide variation in the form of diploma issued by different schools and that any step toward uniformity will probably be long delayed, if ever taken.

The diploma that has been issued by the University of Georgia School of Medicine for the past three years is worded in English, measures 14″ x 17″, is lettered in Old English style, and bears the signatures of the Chancellor of the University System, the Dean of the School of Medicine and the Registrar of the School of Medicine.

As a result of this study, it is probable that we shall retain the English wording rather than the old style Latin diploma formerly issued.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Tentative Program for the Forty-eighth Annual Meeting to be held in San Francisco, California, October 25, 26 and 27, 1937.

Headquarters: Fairmount Hotel

FIRST DAY

Symposium on Examinations

1. E. W. MacEwen, M.D., Dean, College of Medicine, State University of Iowa.
2. H. S. Diehl, M.D., Dean, Division of Medical Sciences, University of Minnesota
3. R. H. Dillehunt, M.D., Dean, University of Oregon Medical School.
4. Robert P. Dobbie, M.D., Assistant Professor of Surgery, University of Buffalo School of Medicine.

Integration of the Teaching in Psychology and Psychiatry

1. Calvin P. Stone, Ph.D., Professor of Psychology, Stanford University.
2. George S. Johnson, M.D., Professor of Psychiatry, Stanford University School of Medicine.
3. Franklin G. Ebaugh, M.D., Professor of Psychiatry, University of Colorado School of Medicine.

SECOND DAY

Introduction of Medical Students to the Clinical Subjects

1. **Introductory Course in Medicine:** George Barnett, M.D., Professor of Medicine, Stanford University School of Medicine.
2. **Introductory Course in Surgery:** Frederick L. Reichert, M.D., Professor of Surgery, Stanford University School of Medicine.
3. **The Teaching of Pathology:** William Dock, M.D., Professor of Pathology, Stanford University School of Medicine.

Organization of the Senior Curriculum at the University of California Medical School.

Salvatore P. Lucia, M.D., Assistant Professor of Medicine, University of California Medical School.

Correlation Between the Outpatient Clinic and the Senior Curriculum

Frederick S. Bruckman, M.D., Assistant Clinical Professor of Medicine, University of California Medical School.

THIRD DAY

Symposium on Community Aspects of Medicine

1. H. R. Wahl, M.D., Dean, University of Kansas School of Medicine.
2. B. W. Black, M.D., Director Alameda County Institutions.
3. Ralph Couch, M.D., Secretary University of Oregon Medical School and Director of Hospitals and Clinics.

Cultivation of Health in Relation to the Medical Curriculum

E. Stanley Ryerson, M.D., Secretary and Assistant Dean, University of Toronto Faculty of Medicine.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 12 SEPTEMBER, 1937 Number 5

The San Francisco Meeting

The forty-eighth annual meeting of the Association of American Medical Colleges will be held in San Francisco, October 25, 26 and 27, 1937. Headquarters is the Fairmount Hotel where all sessions will be held. The tentative program for the meeting is published elsewhere in this issue. The subjects to be discussed and the names of those who will discuss them are indicative of a fine program, one from which much good will come to medical education. Every one who is interested in medical education is cordially invited to attend this meeting and to participate in the discussions on any and all papers presented.

Details as to transportation will be forthcoming in due time. A special 30 day round trip tourist rate of $90.30 with $15.75 extra, one way, for a lower berth, will be in effect. Tickets may be purchased on any date and be good for 30 days. Going and returning routes may differ. There are northern, middle and two southern routes, with stop over privileges going and returning. Arrangements must be made when purchasing tickets. The time of travel between Chicago and San Francisco, via shortest route, is 50 hours—or 39 hours by fast, extra fare train; 13 hours by air. Automobile roads between the two cities are excellent, the time of travel depending on the rate of speed and hours traveled each day. The weather will be good for automobiling.

Los Angeles is anxious to have the delegates to the meeting and others stop over in that city. The Republic of Mexico extends an invitation to automobile travelers, with good roads to Mexico City and elsewhere. Full information as to this trip can be obtained from Mr. A. R. Coleman, 55 Balderas-Mexico, D.F., or any reputable touring agency.

California is a beautiful place to visit at any time of the year, but it is particularly attractive in October. An effort will be made to enhance the pleasure of this trip further by routing delegates to the meeting via Chicago, or Omaha, over one line which has agreed to furnish special cars. Details will be sent out later. Until these are forthcoming, it is suggested not to make any arrangements for the trip to San Francisco—if it is to be made via Chicago or Omaha. Any one wishing to take in some of the beautiful scenery in Colorado can do so by making necessary arrangements before boarding the train in Chicago. The important thing is to COME TO THIS MEETING. The local committee in San Francisco, of which Dr. L. R. Chandler is chairman, has surpassed itself in providing especially pleasurable entertainment for the delegates and their ladies. They must not be disappointed.

* *

And Now—The Allergists!

From time to time, various groups of physicians whose interest lies in a special field which is not recognized as a department or division of a major subject in the curriculum, institute a questionnaire study for the purpose of calling attention to the fact that their subject does not receive the allotment of "hours" in the curriculum which they believe it should have and which the importance of the subject warrants. There is so much that should be taught and so little time in which to do it! Physicians with a special interest overlook the fact that their field is one which should be placed in the category of special study after graduation; that mastery of the subject

can only be obtained by intensive study —after graduation. More and more, the medical curriculum must be patterned to give thorough grounding in the principles and fundamentals of medicine and emphasizing the need for further and continued study after graduation. If the requests for more time and more specific recognition of special fields by allotting more time, specifically designated for that purpose, to these special fields, the day would not be long enough nor four years in medical school anywhere nearly enough to teach all that every physician should know in any one special field. Often enthusiasm creates a demand; or the fact that one suddenly becomes aware that there are many more cases of disease in a given field than one had previously supposed to be the case, arouses a desire for adequate representation in the curriculum even to the extent of "hours" equal to the percentage of occurrence of the disease.

Now, come the allergists. On the basis that from 7 to 10 per cent of the population is afflicted with allergic diseases, the allergists, representing the Association for the Study of Allergy, ask for more "hours" in order that "instruction in these diseases be accorded a relative place in the curriculum which their incidence and severity would seem to justify." The committee which made this study emphasizes "from actual experience that a fairly efficient allergy teaching service can be operated for between 600 and 1,000 visits per year on a negligible budget by one instructor who can devote three to five hours per week to it."

The committee makes the following recommendations:

That the committee on curriculums of the Association of American Medical Colleges be urged to require: (a) the inclusion of planned instruction in the allergic diseases in the curriculums of all recognized medical schools; (b) that the minimum acceptable instruction include discussions of the pathology, pathologic physiology, clinical manifestations, diagnostic methods including skin testing and elimination procedures, the preparation of diagnostic and therapeutic extracts, the essentials of history taking, the principles of specific, symptomatic, and nonspecific therapy, and the practical clinical application of these principles; (c) that instruction in these diseases be assigned to teachers whose chief interest is in the field of allergy; (d) that instruction in these diseases be accorded the relative place in the curriculums which their incidence and severity would seem to justify.

◆ ◆

Value of Education

In the "Gold-Headed Cane" there is a charming scene when Radcliffe visits Meade in his library. He says, "As I have grown older, every year of my life has convinced me more and more of the value of the education of the scholar and the gentleman to the thoroughbred physician. Perhaps, your friend there (pointing to a volume of Celsius), expresses my meaning better than I can myself when he says that the discipline of the mind, 'quamvis non faciat medicum, aptiorem tamen medicinae reddit'." (Though it cannot make a man a doctor, it makes him all the better doctor.)

◆ ◆

Residency in Physical Therapy

Michael Reese Hospital, Chicago, offers a residency in physical therapy to a graduate of an approved medical school who has completed his internship. Applications should be sent to Dr. Charles O. Molander, care Michael Reese Hospital.

◆ ◆

Four Years in Medicine

The first four medical colleges to extend their course of instruction to four years before granting the degree of doctor of medicine in 1893 were: University of Michigan Department of Medicine and Surgery; Harvard University Medical College; University of Pennsylvania Department of Medicine and Chicago Medical College (now Northwestern University Medical School).

College News

Stanford University
School of Medicine

In cooperation with the San Francisco Department of Health and the San Francisco Hospital, the Medical School will conduct postgraduate courses for practising physicians September 6-10, 1937. The registration fee will be $25, with an additional fee of $10 to cover cost of material in the course on surgical anatomy and operative technic.

Nine courses are to be offered: (1) X-ray diagnosis and therapy; (2) emergency surgery and fractures; (3) diseases of the genito-urinary tract; (4) cardiology and electrocardiography; (5) diagnosis and treatment of malignant tumors; (6) surgical anatomy and operative technic; (7) diagnosis, treatment and control of syphilis; (8) ward rounds in medicine; (9) clinics in medical specialties.

Two evening lectures will be delivered: "Evaluation of Recently Introduced Drugs," by Dr. M. L. Tainter, and "Problems in Industrial Health," by Dr. W. P. Shepard.

Application for registration in these courses should be mailed to the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco, California.

◆ ◆

Tulane University
of Louisiana

Plans for expansion of facilities of graduate medical instruction, to become effective at the beginning of the 1937-1938 term, have been completed.

All graduate medical instruction will be conducted under the general supervision of Dr. Hiram W. Kostmayer, as Director of the Graduate Medical Studies in the School of Medicine, and Dr. Maxwell Edward Lapham as Director of the Graduate Medical Extension Division. All graduate courses will be under the immediate supervision and direction of the regular officers of administration and the facilities of the several departments of the School of Medicine will be available.

Gifts: Commonwealth Fund: Preventive medicine, $15,466; student scholarships, $12,550; medical extension courses in Mississippi, $45,000. General Education Board: for support of departments of medicine and surgery, $45,000. State Medical Society and State Department of Health of Mississippi: Medical extension courses in Mississippi, $7,500. American Medical Association: Epidemiology of trichinosis, $300. Josiah Macy, Jr. Foundation: Experimental study of physiology and pathology of blood vessels, $1,200. Eckstein Case: Department of hygiene and tropical medicine, $1,000. Winthrop Chemical Company: Experimental study of atabrine, $200. Salvator D'Antoni: Research, special, $250. G. D. Searle Company: Research, $600. For Library (anonymous), $500. Emergency Committee in Aid of Displaced Foreign Physicians: salary of visiting professor in department of pharmacology, $1,000. Miss Elizabeth Miller: A grant in memory of her father, Dr. C. Jeff Miller, to establish the "C. Jeff Miller Fellowship in Gynecology" for 1937-1938, subject to renewal from year to year, $900.

◆ ◆

University of California
Medical School

Drs. William J. Kerr, professor of medicine, and James F. Rinehart, associate professor of pathology, went East in June, Dr. Kerr to attend the American Medical Association and the American Heart Association, and Dr. Rinehart, the American Association for the Study and Control of Rheumatic

Diseases. Dr. Francis S. Smyth, professor of pediatrics, attended the meetings of the American Pediatric Society, Hot Springs, Virginia, and of the Society for Pediatric Research, Atlantic City, N. J. Dr. Gordon E. Hein, associate professor of medicine, is on sabbatical leave of absence. He will study in London and will visit other medical centers on the continent. Dr. E. S. Sundstroem, associate professor of biochemistry, is on a semi-sabbatical leave.

Dr. Norman F. Miller, professor of obstetrics and gynecology and Bates professor of diseases of women and children at the University of Michigan Medical School, spoke to the staff of the Division of Obstetrics and Gynecology, giving a most interesting sketch of the historical aspect of fistulae. Professor J. F. A. Albert Bessemens, Rector of the University of Ghent, Belgium, who has done considerable experimental work in syphilis and in the fever therapy of syphilis, also spoke.

◆ ◆

Temple University
School of Medicine

Dr. James C. Attix was elected emeritus professor of toxicology.

Appointments: Stanford W. Mulholland, lecturer on urology; J. Ray Van Meter, clinical assistant in neurology; Stanley J. Skromak, Leon Hugh Warren and Kenneth M. Reighter, clinical assistants in dermatology and syphilology; T. H. Swan and Frederick Fiske, clinical assistants in surgery.

Promotions: Glen G. Gibson, from demonstrator to associate in ophthalmology; Louis Cohen, from associate to assistant professor of medicine; M. J. Oppenheimer, from associate to assistant professor of physiology; W. E. Burnett and J. Norman Coombs, from assistant professors to associate professors of surgery; G. P. Giambalvo, from associate to assistant professor of surgery; Reuben Friedman, from lecturer to associate in dermatology; G. C. Henny, to director of the department of physics.

Vanderbilt University
School of Medicine

Promotions: Edna H. Tompkins, associate professor of anatomy; Morton F. Mason, assistant professor of biochemistry; Roy J. Morton, assistant professor of preventive medicine and public health; Herbert C. Francis, assistant professor of radiology; Claude D. Johnson, instructor in obstetrics and gynecology; Rollin A. Daniel, instructor in surgery; William W. Frye, instructor in preventive medicine and public health; John G. Buddingh, instructor in bacteriology; Stewart Auerbach, instructor in pathology; Marvin Corlette, instructor in medicine; Barnett Briggs, instructor in pediatrics; Willard O. Tirrill, Jr., instructor in clinical obstetrics and gynecology.

◆ ◆

Medical College
of Virginia

The College has under construction its first dormitory for men at a cost of $315,000. This building will house the house staff of the college hospitals, approximately fifty and the senior medical class, its total capacity being one hundred forty-seven. The building will be located in the hospital center and will contain in addition to the typical dormitory rooms a cafeteria, private dining rooms, an assembly room seating one hundred fifty, barber shop, and other facilities. The building will be dedicated next spring, probably during the Centennial Celebration of the college.

◆ ◆

Washington University
School of Medicine

Dr. Philip A. Shaffer, for many years professor of biochemistry, and dean from 1915 to 1919, has been appointed dean. Dr. L. W. Dean, professor of otolaryngology, received the gold medal of the American Laryngological Association. Dr. Joseph Erlanger, professor of physiology, received the honorary degree of doctor of science from the University of Michigan.

Long Island College of Medicine

New appointments and promotions: Tasker Howard, professor of clinical medicine, has been appointed professor of medicine and physician in chief to the Long Island College Hospital, to succeed the late Luther F. Warren. Robert L. Moorhead has been appointed professor of clinical otolaryngology, in succession to Dr. C. W. Stickle, who has been made emeritus professor. Fedor L. Senger, formerly assistant clinical professor in the department of urology, has been promoted to the professorship of clinical urology. He succeeds Dr. J. S. Read, who has been made professor emeritus.

A separate Department of Preventive Medicine and Community Health has been established under the direction of Dr. Alfred E. Shipley. At the opening of the next academic year, the major part of the work of this Department will be done in the Red-Hook-Gowanus Health Center of the New York City Department of Health.

◆ ◆

University of Utah School of Medicine

G. Albin Matson, Ph.D., associate professor of bacteriology, Montana State University, Missoula, has been appointed an assistant professor in the department of bacteriology and pathology.

◆ ◆

University of North Dakota School of Medicine

The state legislature has appropriated an annual budget of about $30,000 to effect a reorganization of the Medical School. A number of full time teachers will be added to the faculty and additional equipment provided.

◆ ◆

Columbia University

A department of nursing has been established with full rating and under the direction of the faculty of medicine. Graduates will receive the bachelor of science degree.

University of Cincinnati College of Medicine

A gift of $4,000 to establish a laboratory for research on the effect of diet in nervous diseases is announced. Drs. Tom D. Spies, associate professor of medicine, and Charles D. Aring, instructor in medicine, will be in charge of the laboratory. The gift was made by Mr. William J. Shroder and his sisters in honor of their parents, Judge and Mrs. Jacob Shroder, whose name the laboratory will bear.

◆ ◆

Medical College of the State of South Carolina

Promotions: John F. Townsend and Josiah E. Smith, to be professors of ophthalmology, otology, rhinology and laryngology; Robert Lane McCrady, associate professor of gynecology and obstetrics; Henry William de Saussure, associate professor of obstetrics; William Atmar Smith, Joseph Henry Cannon, John Julius La Roche, Jr., and Olin B. Chamberlain, associate professors of medicine; Thomas Hutson Martin, assistant professor of surgery; Pierre Gautier Jenkins, assistant professor of ophthalmology, otology, rhinology and laryngology.

◆ ◆

Baylor University College of Medicine

Changes: Evan W. McChesney, associate professor of biological chemistry, University of North Carolina School of Medicine, Chapel Hill, joined the faculty with the same title. Augustus S. Rose, associate professor of anatomy, resigned to become assistant in neurology at Massachusetts General Hospital, Boston.

◆ ◆

University of Minnesota Mayo Foundation

Dr. Donald C. Balfour, associate director, Mayo Foundation, Rochester, has been appointed director, effective July 1, to succeed Dr. Louis B. Wilson, who has become director emeritus.

Duke University
School of Medicine

Dr. W. H. Stoner, of the Burroughs Wellcome and Company Experimental Research Laboratories, London, England, lectured to the staff and students on "Sulfamilamide Therapy," and Dr. Jonas S. Friedenwald, of the Wilmer Institute of Ophthalmology, Johns Hopkins Hospital, lectured on "Interpretation of Retinal Changes."

At the graduating exercises of Duke University, held June 7th, forty-eight students received the degree of Doctor of Medicine, and six the degree of Bachelor of Science in Medicine.

During the year 1936-37, the following senior medical students were elected to Alpha Omega Alpha fraternity: R. D. Adams, H. I. Harvey, H. M. Horack and S. Rumpanos.

Faculty appointments: Joseph W. Beard, assistant professor of surgery; J. Lamar Callaway, instructor in dermatology, syphilology and medicine; Walter L. Thomas, assistant professor of obstetrics and gynecology; Karl A. Youngstrom, instructor in anatomy, and Cyrus C. Erickson, instructor in pathology.

During the summer quarter the following students are studying in London for credit here: W. R. Haas, A. H. Joistad, W. H. Kaufman and E. H. Thornhill.

◆ ◆

Jefferson Medical College

Faculty changes: John F. Corby, professor of military science and tactics; Henry K. Mohler, clinical professor of therapeutics; Baldwin L. Keyes, clinical professor of psychiatry; Willard H. Kinney, clinical professor of genito-urinary surgery; Samuel A. Loewenberg, clinical professor of medicine; William A. Kreidler, associate professor of bacteriology; J. Hall Allen, assistant professor of proctology; Norman M. MacNeill, assistant professor of pediatrics; William J. Harrison and Sidney L. Olsho, assistant professors of ophthalmology.

Wayne University
College of Medicine

The Journal of the Wayne University College of Medicine made its bow in June, and with credit. Those who are responsible for its being and appearance are to be commended. The Journal will be published quarterly under the direction of members of the junior and senior classes and the guidance and assistance of a faculty alumni board. Contributions are by students and faculty members.

Dr. Arthur H. Smith, associate professor of biochemistry has been appointed professor and head of the department of physiological chemistry.

◆ ◆

Yale University
School of Medicine

Promotions: Dr. Leonard Greenburg, professor of public health; Daniel C. Darrow, associate professor of pediatrics; Edwin F. Gildea, associate professor of psychiatry; Howard S. Colwell, associate professor of medicine; Hugh M. Wilson, associate professor of radiology; Ralph H. Jenkins, associate professor of urology; Paul H. Lavietes, John H. Bumstead, and Harry E. Klebanoff, assistant professors of medicine; Bernhard A. Rogowski, assistant professor of neurology; Louis S. Goodman, assistant professor of pharmacology and toxicology; Ralph G. Meader, assistant professor of anatomy; Herman Yannet, assistant professor of pediatrics.

◆ ◆

University of Oklahoma
School of Medicine

New appointments: Berry Campbell, assistant professor of anatomy, from Western Reserve Medical School; Francis C. Lawler, assistant professor of bacteriology, from the Emery Laboratory of Cancer Research of St. Luke's and Children's Hospital, Philadelphia; A. J. Sheldon, assistant professor of bacteriology ad interim, from Johns Hopkins School of Hygiene and Public

Health; Irvin S. Danielson, Harvard Medical School, assistant professor of biochemistry; Arnold John Lehman, Stanford University, assistant professor of pharmacology; Andrew Parks McLean, University of Florida, instructor in pharmacology. A second assistant professor of pathology will shortly be appointed; also a full-time professor of orthopedic surgery.

◆ ◆

Albany Medical College

Dr. Joseph Lewi Donhauser, associate professor of surgery, has been appointed professor of surgery and executive head of the department of surgery to succeed Dr. Arthur W. Elting, who retired July 1. Dr. Lemuel Whittington Gorham, associate professor of medicine, will succeed Dr. Thomas Ordway as professor of medicine and executive head of the department, and Dr. Arthur J. Wallingford, associate in gynecology, will succeed Dr. John A. Sampson as professor and head of the department of gynecology. Dr. Donhauser becomes surgeon in chief at Albany Hospital and Dr. Gorham consulting physician.

◆ ◆

State University of Iowa
College of Medicine

The John and Mary R. Markle Foundation has made a grant of $10,00 to Dr. H. P. Smith, department of pathology, for research on blood clotting and the bleeding tendency.

◆ ◆

West Virginia University
School of Medicine

The Ella Sachs Plotz Foundation has given a grant of $350.00 to Dr. Edward J. Van Liere, dean and professor of physiology, to study the effects of anoxemia on absorption from the small intestine in the mammal.

Tufts College
Medical School

Activities have been initiated to raise a fund of $2,000,000 for improvements in the medical school. The report stated that a surgical unit of from fifty to sixty beds is urgently needed to complete the New England Medical Center group, which is composed of the Boston Dispensary, the Boston Floating Hospital and the medical school.

◆ ◆

University of Wisconsin
Medical School

The Charles R. Bardeen Memorial Lecture honoring the late dean of the Medical School, was presented at the university under the auspices of the Phi Chi fraternity. Dr. Jacob Arnold Bargen, Rochester, Minn., gave the lecture on "Recent Advances in Studies on Intestinal Disorders in Europe and America: Personal Observations."

◆ ◆

Louisiana State University
Graduate School of Medicine

Dr. Isidore Cohn, professor and head of the department of surgery, Graduate School of Medicine, Tulane University, New Orleans, has resigned to become professor of surgery and associate director. Dr. James T. Nix is director of the school. It is planned to begin instruction in the Fall of this year.

◆ ◆

University of Pennsylvania
School of Medicine

The estate of Miss Frances T. Kinsey has provided a fund of about $200,000 for study of digestive disorders. The fund is to be known as the Kinsey-Thomas Foundation for the Study and Treatment of Diseases of the Digestive System. It will be under the direction of Dr. Thomas Grier Miller.

General News

Medical Education in U. S. S. R.

The Soviets are making every effort to supply their people with adequate medical care. Special programs are set up to provide what might be termed specialists in various fields by arranging courses with that end in view. For instance, the educational program of the general practitioner, or therapeutist, is entirely different from the program of one who will be an obstetrician or a pediatrician or a health officer. It would appear that there has been an inadequate supply of physicians in the U. S. S. R. In 1913, for example, there were only 19,800 physicians in Russia. In 1928, under the Soviet regime, the number had increased to 63,200; in 1932, to 77,900; in 1933, to 80,800 and in 1935, to 90,000.

In the training of medical personnel, the figures for the higher medical schools are as follows:

	1914	1928	1935	1936
No. of graduates....	900	6,200	6,900	.....
No. of students....no inf.		26,000	61,800	76,300
Medical Technicums:				
No. of graduates..2,000		4,800	14,100	.....
No. of students.....8,300		18,800	65,100	81,800

September, 1935, there were 64 medical schools in the U. S. S. R., with 77,215 students, of whom 9,500 were in the last year of the course. In 1937, it is reported, 20,000 physicians will be graduated. In the past two years, 698 new junior medical schools were established. These will prepare junior medical workers. In 1935, 58,000 students were enrolled in these schools; in 1936, 89,000. In September, 1936, a decree was issued on the preparation of semi-qualified medical, dental and pharmacological personnel, which provides for the establishment of the following types of schools in addition to the medical technicians already in existence:

1. 3 year feldsher (junior medical worker) schools for 44,770 students.
2. 2 year obstetrical schools for 13,300 students.
3. 2 year nursing schools for 95,000 students.
4. 2 year infant and children nursing schools.
5. 1 year course for laboratory assistants for 5,200 students.

It is expected that these schools will have a registration of 158,270 students in the fall of 1937.

January 1, 1936, the U. S. S. R. had 258 medical institutes with 36 branches and a total of 9,472 scientific workers and assistants.

◆ ◆

Wisconsin State Board of Medical Examiners on Foreign Graduates

Graduates of foreign medical schools, with the exception of graduates of Canadian schools, will not be recognized in the future, in accordance with a resolution unanimously approved by the board recently.

◆ ◆

Research in Endocrinology

The John and Mary R. Markle Foundation, New York, has appropriated $100,000 to the National Research Council for the support of research in endocrinology in the next three years. The fund will be administered by the division of medical sciences and will be allotted in grants for approved programs of research in this field to be conducted in institutions which may wish to collaborate in the investigations, according to *Science*.

◆ ◆

Finney-Howell Research Foundation

Under the will of the late Dr. George Walker, who was chief of the outpatient department of Johns Hopkins Hospital, Baltimore, $300,000 is provided for the creation of a foundation for the study of

cancer. The money is to be spent in ten years. Dr. Walker died from cancer last March. The foundation is named in honor of Dr. J. M. T. Finney, emeritus professor of surgery, and Dr. Wm. H. Howell, emeritus professor of physiology, at Johns Hopkins University.

The primary object of the foundation is to provide a series of fellowships for the study of cancer, each with an annual stipend of $2,000, although special grants may be made to support the work done by the fellows. With no laboratory or institute of its own, the foundation will expend all the money in supporting the work of the fellows.

The fellowships will be annual appointments but may be renewed for a period of three years and may be awarded to workers in institutions in any part of the world. Members of the board of scientific directors include Drs. Finney and Howell; Philip Bard, Ph.D., Drs. Curtis F. Burnam, William A. Fisher, Wade Hampton Frost and Warren H. Lewis of Baltimore; Evarts G. Graham, St. Louis; Ernest L. Kennaway, London; Jonathan C. Meakins, Montreal, and Florence R. Sabin, New York. The financial directors of the foundation are Jesse N. Bowen, Frederick G. Boyce, Jr., and Lee E. Daly, all of Baltimore.

◆ ◆

National Institute of Health

Under the recent reorganization of the Scientific Research Division of the U. S. Public Health Service, effective February 1, three new divisions were established at the National Institute of Health: the division of biologics control under the direction of Sr. Surg. Walter T. Harrison; the division of public health methods, which incorporates the work of the former field office of public health methods with the work of the offices of child hygiene, milk investigations, statistical investigations and the laboratory of stream pollution investigations, under the direction of Surg. Joseph W. Mountin, and the division of industrial hygiene, which coordinates the work of the former office of industrial hygiene and the extensive laboratory studies of occupational dermatoses carried on at the National Institute of Health, under the supervision of Sr. Surg. Royd R. Sayers. The former division of bacteriology and pathology was further reorganized so that part of the division relating to bacteriology is known as the division of infectious diseases. Under the direction of Sr. Surg. Rolla E. Dyer, this division covers the field and laboratory work relating to infectious diseases, including leprosy studies, malaria investigations, the Rocky Mountain Laboratory, tuberculosis and epidemiologic studies. The division of pathology now includes the field office of cancer investigations. The former divisions of chemistry, pharmacology and zoology of the institute remain under the direction of Claude S. Hudson, Ph. D., Carl Voegtlin, Ph.D., and Maurice C. Hall, D.V.M., respectively. According to the *Health Officer,* the National Institute of Health has become, in fact, the Scientific Research Division. Asst. Surg. Gen. Lewis R. Thompson, in charge of scientific research, is now director of the institute.

◆ ◆

German Congress for Postgraduate Study

On August 21-24, 1937, a congress for postgraduate study in medicine was held in Berlin, Germany, under the auspices of the Deutsche aertzliches Fortbildungswesen of which Professor Dr. Adam, Robert Koch Platz, No. 7, is the Geschaeftsfuehrer or director. A cordial invitation is extended to American physicians who are interested in this movement to attend this Congress and to speak on the activities in progress in America to continue the education of the physician, especially as proposed by the various specialty boards of which there are now twelve.

In Germany, such courses are obligatory, being prescribed by the government for the purpose of keeping all physicians up to date on progress in medi-

cine. The Congress will, therefore, be of special interest to physicians of other countries, especially America, as it will give opportunity to become familiar with the plans made in Germany to achieve the proposed aim. Details as to the Congress can be secured by addressing Professor Adam at the address given above.

◆ ◆

Dazian Foundation for Medical Research

The late Henry Dazian, of New York City, bequeathed the bulk of his estate for the creation of the Dazian Foundation for Medical Research and to promote the advancement of medical and allied scientific knowledge by the establishment of fellowships for individuals or institutions not engaged for private profit or gain. The Foundation is managed by nine members, five of whom are physicians: Drs. Emanuel Libman, Israel Strauss, Alexis Carrel, Philip Finkle, New York, and Harrison S. Martland, Newark, N. J. Twenty-five years after the death of the testator the principal of the trust is to be distributed to such hospitals, sanatoriums or similar institutions as the Board shall determine.

◆ ◆

Nemours Foundation

The foundation was provided for in the will of the late Alfred I. Du Pont to establish a hospital and home for crippled children. It will also give aid to children suffering from other diseases. The first unit of the institution will cost about $1,000,000 and be situated on the Du Pont estate, near Blue Ball, on the Concord Pike. The will further provided that a certain amount of care be given to aged persons and that the bulk of the estate be used to maintain the foundation and research activities. Headquarters of the foundation will be in Jacksonville, Fla., where Mr. Du Pont died April 29, 1935. The entire reources of the foundation, comprising about $60,000,000, will be used for the treatment and care of crippled children.

Dr. Alfred R. Shands, Jr., associate professor of surgery in charge of orthopedics, Duke University School of Medicine, Durham, N. C., has been appointed chief of the medical staff of the Nemours Foundation.

◆ ◆

Jane Coffin Childs Memorial Fund for Scientific Research

An endowment of $10,000,000 has been set up by Starling W. Childs, of New York, to be devoted to research on cancer under the direction of Yale University.

The deed of gift provides that if, and when, the cancer problem is solved, the foundation is to devote its time to unsolved medical problems in other fields of science. Under the deed the foundation, which is expected to cooperate closely with Yale University School of Medicine, will be administered by a board of managers advised by a board of scientific advisers. The latter board will include Dr. Stanhope Bayne-Jones, Rudolph J. Anderson, Ph.D., Drs. Ross G. Harrison and Milton C. Winternitz, all of Yale, and Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research, New York.

◆ ◆

Henry Jacob Bigelow Medal

Dr. Edward W. Archibald, professor of surgery and director of the department of surgery, McGill University Faculty of Medicine, Montreal, was presented with the Henry Jacob Bigelow Medal of the Boston Surgical Society. Dr. William C. Quinby, Boston, president of the society, made the presentation, and Dr. Archibald spoke on "French Surgery in the First Half of the Nineteenth Century." Under the will of William Sturgis Bigelow, in memory of his father, a sum of money was presented to the society, "the income of which is to be used from time to time for the presentation of a gold medal to some outstanding surgeon for his work in the advancement of the science of surgery."

Research in Biology and Medicine

The Rockefeller Foundation has given $36,000 to the University of Minnesota for research in biology and medicine. The project will involve the construction of high voltage equipment in the physics laboratory, consisting principally of a giant Van de Graff generator capable of producing from six to eight million volts of electricity.

◆ ◆

Advisory Council on Medical Specialties

A commission to study the problem of graduate medical education is to be appointed. The personnel of this commission will consist of men who are active in this field or who have given graduate medical education much thought. The president of the Advisory Council, Dr. Willard C. Rappleye, dean of Columbia University College of Physicians and Surgeons, represents the Association of American Medical Colleges in the Council. The association has been actively promoting graduate medical work for many years.

◆ ◆

Medical Education in North Carolina

Gov. Clyde R. Hoey has appointed a commission authorized by the recent legislature to study the advisability of establishing another four year medical school in the state. Members of the commission are Drs. William M. Coppridge, Durham; William de B. MacNider, Chapel Hill, dean, University of North Carolina School of Medicine; Coy C. Carpenter, Wake Forest, dean of Wake Forest College School of Medical Sciences; Thomas W. M. Long, Roanoke Rapids, secretary of the Medical Society of North Carolina; Benjamin J. Lawrence, Raleigh, secretary of the state board of medical examiners; Judge L. R. Varser, Lumberton, and Joe W. Garrett, Madison. The commission will submit a report to the 1939 general assembly.

◆ ◆

Rockefeller Hospital

Dr. Rufus Cole, director of the Hospital of the Rockefeller Institute for Medical Research since 1909, retired June 30 on account of age.

Dr. Thomas M. Rivers, a director of the International Health Division of the Rockefeller Foundation, will succeed Dr. Cole.

◆ ◆

Pan-American Postgraduate Schools and Hospitals

At a meeting of the New York chapter of the Pan-American Medical Association last month, Dr. Jose Arce, president of the Argentine chapter, outlined a plan to establish Pan-American postgraduate schools and hospitals in every large metropolis in South and Central America. They would be patterned after the $20,000,000 medical center which, it was announced last year, would be erected in New York City under the sponsorship of the association.

◆ ◆

Lucuis N. Littauer Institute for Speech Disorders

Mr. Lucuis N. Littauer has given to the National Hospital for Speech Disorders, New York, a gift of about $220,000 for research and teaching as well as treatment. Dr. James S. Greene, director of the hospital, will be medical director of the new institute. Mr. Littauer is president and Dr. Bernard Sachs, vice president.

Book News

Heart Failure

By Arthur M. Fishberg, M.D., Associate in Medicine, Mount Sinai Hospital, New York City. Lea & Febiger, Philadelphia. 1937. Price, $8.50.

This book is intended, primarily for the general practitioner.

The fundamental point of view is that afforded by the recent quantitative investigations of the circulation in health and disease which have proved so fruitful in bedside practice. Recent studies of cardiac output, velocity of blood flow, circulating blood volume, venous pressure, the respiratory volumes, and the gas contents and reaction of the arterial blood are all described in detail and are related directly to practice. The book should be of particular value to the busy physician who finds it difficult to keep abreast of the numerous advances along these lines which have followed one another so rapidly in the past few years. Special emphasis is placed on the pathogenesis of the individual symptoms of heart failure, knowledge of which is indispensable to rational treatment. Peripheral circulatory failure and shock are discussed at length and the various forms of circulatory failure are classified on the basis of the nature of the disturbance in circulatory dynamics. The dominant point of view is always that of the practicing physician who must treat his patients with little instrumental aid, but who nevertheless wants to know the why and wherefore of what he does.

◆ ◆

Health Education of the Public

By W. W. Bauer, M.D., Director Bureau of Health and Public Instruction, American Medical Association, and Thomas G. Hull, Ph.D., Director Scientific Exhibit, American Medical Association and Associate Professor of Bacteriology, University of Illinois College of Medicine. W. B. Saunders Company, Philadelphia. 1937. Price, $2.50.

The physician or the worker in the field of public health will find here opportunity to accumulate in a short time knowledge which might otherwise be gained only with great difficulty and considerable expense by the old system of trial and error. Among the topics discussed are the radio; the exhibit; the meeting; pamphlets; newspaper; motion picture; stereopticon slides; magazine articles; books; miscellaneous devices; correlation of technics into a program.

◆ ◆

The Common Neuroses: Their Treatment by Psychotherapy

By T. A. Ross, M.D., formerly Medical Director, Cassel Hospital for Functional Nervous Disorders, England. 2d. Ed. William Wood & Company, Baltimore. 1937. Price, $4.

The author maintains that the majority of patients suffering from neurosis can be treated by the general practitioner. Hence, this work should prove of value to the physician and, perhaps, also to the student whose intent is later to enter this specialty.

◆ ◆

Manual of Diseases of the Eye

By Charles H. May, M.D., 15th Ed. William Wood & Company, Baltimore. 1937. Price, $4.

For more than the span of one generation this book has been used in many medical colleges as the standard text for diseases of the eye, hence it is needless to stress its worth. Few books can boast of fifteen editions in thirty-seven years. It is written for the student although the practitioner can make good use of it in his daily work. It is still an excellent small book sold at a price which every student can afford.

Trends In Medical Practice *

H. G. WEISKOTTEN

Dean, Syracuse University College of Medicine

In an effort to throw some light on trends in medical practice, I have during recent years made several studies of the graduates of the medical colleges of this country.[1] It was planned to study the graduates six years after graduation feeling that by this time most of them would have established themselves in some field of medical practice. However, my first study was made in 1926 and included the graduates for the years 1915 and 1920. Thus the study of the 1915 graduates was made eleven years after graduation, whereas studies of the graduates of 1920, 1925, and 1930 were made six years after graduation. Wherever possible the data for the 1915 graduates have been adjusted to make them comparable to those for the graduates of the other years. In the last two studies I have included the graduates of the Canadian schools offering the full medical course. These two studies were supported by grants made by the Josiah Macy Jr. Foundation.

The studies are based on questionnaires returned by the graduates of the various medical schools. The graduates manifested an excellent spirit of cooperation which I greatly appreciated. The form of the questionnaire used in connection with the present study is shown in Figure 1. In connection with the several studies, a total of 10,721 questionnaires was filled out and returned. I now have data on 76.3 per cent of the graduates to whom questionnaires were sent.

No data are available for the 1915 or 1920 graduates of the following schools: University of Cincinnati College of Medicine, Loyola University School of Medicine, New York Homeopathic Medical College and Flower Hospital, and Temple University School of Medicine. The University of Rochester School of Medicine and the University of Wisconsin Medical School did not graduate classes in 1915, 1920, and 1925. The University of Arkansas School of Medicine did not graduate a class in 1920.

Approximately 75 per cent of the 1930 graduates responded to the questionnaires sent out in connection with the present study. The highest percentage of returns (96.3%) was received from the graduates of Western Reserve University School of Medicine, and the lowest (54.8%) from the graduates of Howard University Medical School. In general, the percentage returns from the graduates of the Canadian schools were not as high as from the graduates of the American schools.

---

1. Weiskotten, H. G.: A Study of Present Tendencies in Medical Practice, Bull. Assoc. Am. M. Colleges, 3:130 (April) 1928; Present Tendencies in Medical Practice, Proc., Congress on Medical Education, Licensure, Public Health and Hospitals, Chicago, February 6, 7 and 8, 1928; Tendencies Toward Specialization, Proc., Congress on Medical Education, Medical Licensure and Hospitals, Chicago, February 15 and 16, 1932; Tendencies in Medical Practice, J. Assoc. Am. Med. Colleges, 7:65 (March) 1932.

*Read at the Forty-seventh Annual Meeting of the Association of American Medical Colleges, held in Atlanta, Georgia, Oct. 26-28, 1936. Aided by a grant from the Josiah Macy, Jr. Foundation.

Table 1. Number and percentage of questionnaires returned by medical college graduates, according to college: 1915, 1920, 1925, and 1930.

College	Total questionnaires			1915 questionnaires			1920 questionnaires			1925 questionnaires			1930 questionnaires		
	Sent	Returned		Sent	Returned		Sent	Returned		Sent	Returned		Sent	Returned	
		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total
All medical colleges	14,185	10,721	75.6	2401	1834	76.4	2524	1947	77.1	4302	3230	75.1	4958	3710	74 8
American medical colleges	13,321	10,165	76.3	2401	1834	76.4	2524	1947	77.1	3862	2948	76.3	4534	3436	75.8
Albany Medical College	102	81	79.4	46	38	82.6	20	16	*	16	13	*	20	14	*
University of Arkansas School of M.	69	54	78.3	17	11	*	—	—	—	23	21	*	29	22	75.9
Baylor University College of Med.	159	129	81.1	16	10	*	30	23	76.7	27	25	93.0	86	71	82.6
Boston University School of Med.	127	96	75.6	19	14	*	11	8	*	50	36	72.0	47	38	80.9
University of Buffalo School of Med.	226	162	71.7	53	42	79.2	57	42	73.6	51	38	74.5	65	40	61.5
University of California Med. School	134	104	77.6	11	10	*	21	15	*	49	42	85.7	53	37	69.8
University of Cincinnati Coll. of M.	120	100	83.3	**	—	—	**	—	—	64	57	89.1	56	43	76.8
University of Colorado School of M.	98	84	85.7	8	7	*	18	15	*	31	26	85.6	41	36	87.8
Columbia Univ. Coll. of Phys. & S.	367	288	78.5	80	62	77.5	90	76	84.4	94	77	81.9	103	73	70.9
Cornell University Medical College	182	123	67.6	20	10	*	51	29	56.9	57	41	71.9	54	43	79.6
Creighton University School of M.	144	113	78.5	36	30	83.3	23	20	*	36	28	77.8	49	35	71.4
Emory University School of Med.	282	207	73.4	146	98	67.1	31	24	77.4	59	49	83.1	46	36	78.3
Georgetown University School of M.	184	120	65.2	27	21	77.8	15	9	*	42	29	69.0	100	61	61.0
George Washington Univ. School of Medicine	137	102	74.5	23	18	*	22	16	*	45	36	80.0	47	32	68.1
University of Georgia School of M.	81	65	80.2	11	8	*	15	13	*	25	19	76.0	30	25	83.3
Hahnemann Medical Coll. and Hosp.	180	122	67.8	20	14	*	36	26	80.6	48	35	72.9	76	47	61.8
Harvard University Medical School	429	344	80.2	80	64	80.0	93	74	79.6	122	96	78.7	134	110	82.1
Howard University College of Med.	186	99	53.2	20	11	*	28	13	46.4	76	41	53.9	62	34	54.8
University of Illinois Coll. of Med.	395	271	68.6	88	50	56.8	80	47	58.8	103	83	80.6	124	91	73.4
Indiana University School of Med.	256	210	82.0	27	26	96.3	40	31	77.5	87	73	83.9	102	80	78.4
State University of Iowa Coll. of M.	248	215	86.7	22	20	*	53	45	84.9	76	68	89.5	97	82	84.5
Jefferson Med. Coll. of Philadelphia	566	441	77.9	131	105	80.2	162	130	80.2	133	100	75.3	140	106	75.7
Johns Hopkins Univ. School of Med.	327	280	85.6	83	73	88.0	98	84	85.7	78	60	76.9	68	63	92.6
University of Kansas School of Med.	110	85	77.3	10	8	*	21	16	*	32	23	71.4	47	38	80.9
Long Island College of Medicine	336	251	74.7	70	52	74.3	76	55	72.4	94	73	77.7	96	71	74.0
Univ. of Louisville School of Med.	222	173	77.9	49	39	79.6	26	16	61.5	63	51	81.0	84	67	79.8
Loyola University School of Med.	139	89	64.0	**	—	—	**	—	—	50	30	60.0	89	59	66.3
Marquette University School of Med.	136	109	80.1	25	20	80.0	12	11	*	38	29	76.3	61	49	80.3
Univ. of Maryland School of Med. and Coll. of Physicians and Surg.	289	216	74.7	66	49	74.2	53	43	81.1	83	62	74.7	87	62	71.3
College of Medical Evangelists	173	128	74.0	12	9	*	16	12	*	67	50	74.6	78	57	73.1
Meharry Medical College	168	79	47.0	65	25	38.5	34	10	29.4	32	19	59.4	37	25	67.6
University of Michigan Med. School	428	340	79.4	42	35	83.3	73	58	79.5	155	121	78.0	158	126	79.7
University of Minnesota M. School	315	257	81.6	36	30	83.2	62	58	93.5	89	72	80.9	130	97	74.6
University of Nebraska Coll. of M.	217	184	84.8	10	7	*	39	37	94.9	103	81	78.6	65	59	90.8

University of Minnesota M. School	315	257	81.6	34	30	88.2	62	58	93.6	89	73	82.0	130	91	71.0
University of Nebraska Coll. of M.	217	184	84.8	10	7	*	39	37	94.9	103	81	78.6	65	59	90.8
New York Homeopathic Medical College and Flower Hospital	112	68	60.7	**	—	—	**	—	—	30	16	53.3	82	52	63.4
New York University Coll. of Med.	414	305	73.7	87	71	81.6	109	72	66.1	102	74	72.5	116	88	75.9
Northwestern University M. School	333	254	76.3	42	29	69.0	66	52	78.8	98	80	81.6	127	93	73.2
Ohio State University Coll. of Med.	204	164	80.4	42	35	83.3	22	20	*	83	62	74.7	57	47	82.5
Univ. of Oklahoma School of Med.	111	84	75.7	18	13	*	15	11	*	31	19	61.3	47	41	87.2
University of Oregon Medical School	114	97	85.1	16	10	*	12	10	*	45	42	93.3	41	35	85.4
Univ. of Pennsylvania School of M.	442	346	78.3	54	46	85.2	129	103	79.9	134	100	74.6	125	97	77.6
Univ. of Pittsburgh School of Med.	149	130	87.2	10	9	*	33	31	93.9	47	36	76.6	59	54	91.5
Univ. of Rochester School of Med.	24	22	*	**	—	—	**	—	—	**	—	—	24	22	*
Rush Med. Coll. (Univ. of Chicago)	473	344	72.7	84	73	86.9	105	85	81.0	144	87	60.4	140	99	70.7
St. Louis University School of M.	306	233	76.1	39	33	84.6	60	49	81.7	86	65	75.6	121	86	71.1
Medical College of the State of South Carolina	109	84	77.1	24	19	*	15	12	*	35	26	74.6	35	27	77.1
Stanford University School of Med.	110	96	87.3	16	14	*	19	16	*	27	22	81.5	48	44	91.7
Syracuse University College of M.	136	120	88.2	12	12	*	35	34	97.1	43	35	81.4	46	39	84.8
Temple University School of Med.	100	64	64.0	**	—	—	**	—	—	48	29	60.4	52	35	67.3
University of Tennessee Coll. of M.	212	161	75.9	60	43	71.7	15	11	*	57	47	82.5	80	60	75.0
University of Texas School of Med.	200	154	77.0	33	29	87.9	65	47	72.3	58	46	79.3	44	32	72.7
Tufts College Medical School	360	248	68.9	61	38	62.3	79	50	63.3	104	79	76.0	116	81	69.8
Tulane University of Louisiana School of Medicine	336	253	75.3	71	59	83.1	81	58	71.6	84	66	78.6	100	70	70.0
Vanderbilt University School of M.	203	145	71.4	86	59	68.6	27	18	66.7	43	35	81.4	47	33	70.2
University of Vermont Coll. of Med.	118	98	83.1	33	32	97.0	21	21	*	35	24	68.7	39	31	72.4
Medical College of Virginia	268	199	74.3	88	63	71.6	22	16	*	62	45	72.6	96	75	78.1
University of Virginia Dept. of M.	162	135	83.3	25	20	80.0	27	26	96.3	53	45	84.9	57	44	77.2
Washington Univ. School of Med.	222	179	80.6	29	28	96.6	42	37	88.1	75	56	74.7	76	58	76.3
Wayne University College of Med.	155	119	76.8	39	28	71.8	39	29	74.4	27	22	81.5	50	40	80.0
Western Reserve Univ. School of M.	178	158	88.8	32	30	93.8	53	44	84.6	40	32	80.0	54	52	96.3
University of Wisconsin Med. School	37	28	75.7	**	—	—	**	—	—	**	—	—	37	28	75.7
Woman's Med. Coll. of Pennsylvania	79	52	65.8	26	18	69.2	10	7	*	29	17	58.6	14	10	*
Yale University School of Medicine	122	104	85.2	7	7	*	18	16	*	44	37	84.1	53	44	83.0
Canadian medical colleges	864	556	64.4	**	—	—	**	—	—	440	282	64.1	424	274	64.6
University of Alberta Faculty of M.	38	24	63.2	—	—	—	—	—	—	11	7	*	27	17	63.0
Dalhousie University Faculty of M.	61	41	67.2	—	—	—	—	—	—	43	28	65.1	18	13	*
Laval University Faculty of Med.	69	41	59.4	—	—	—	—	—	—	31	17	54.8	38	24	63.2
Univ. of Manitoba Faculty of Med.	95	55	57.9	—	—	—	—	—	—	48	30	62.5	47	25	53.2
McGill University Faculty of Med.	176	115	65.3	—	—	—	—	—	—	85	59	69.4	91	56	61.5
Univ. of Montreal Faculty of Med.	111	66	59.5	—	—	—	—	—	—	72	39	54.2	39	27	69.2
Queen's University Faculty of M.	45	30	66.7	—	—	—	—	—	—	**	—	—	45	30	66.7
University of Toronto Faculty of M.	219	150	68.5	—	—	—	—	—	—	128	86	67.2	91	64	70.3
Univ. of Western Ontario M. School	50	34	68.0	—	—	—	—	—	—	22	16	*	28	18	64.3

*Per cent not shown when base is less than 25.
**Graduates of this college were not included in the study for the year in question.

Medical College .....
Year of graduation .....

1. Name ..... (Christian name) (Surname) 2. Present age .....
3. Address ..... (Street and number) (City) (State)
4. Are you engaged in general practice? ..... (Yes or No)
5. (a) Is your practice limited to a specialty? ..... (Yes or No)
   (b) If so, please name specialty .....
   (c) After how many years of general practice did you limit your practice to a specialty? .....
6. (a) Are you doing general practice with special attention to a specialty? ..... (Yes or No)
   (b) If so, please name specialty .....
7. (a) If your practice is not now limited to a specialty, do you contemplate such limitation? ..... (Yes or No)
   (b) If so, when? .....
   (c) What specialty do you plan to pursue when you limit? .....
8. (a) What type interneship did you have? .....
   (b) Have you had any other special training since graduation? .....
9. (a) Do you hold a full-time salaried position? ..... (Yes or No)
   (b) What is the nature of the work? .....
   (c) If you hold such a position, are you able to engage in the private practice of medicine as well? ..... (Yes or No)
10. (a) Do you hold a part-time salaried position? ..... (Yes or No)
   (b) What is the nature of the work? .....
11. (a) Do you hold any non-salaried position on a percentage or fee basis? ..... (Yes or No)
   (b) Please describe the nature of this position and state whether full-time or part-time .....

REMARKS:

Please Fill Out Immediately and Mail To DEAN H. G. WEISKOTTEN, Syracuse, N. Y.

FIGURE 1.

Table 1 shows by colleges the number of questionnaires sent out and the number and percentage returned.

Statistical studies of the accumulated data have been made and the results tabulated. The tabulations are both general and specific, that is, I have data for the group as a whole, for the graduates of American and Canadian medical schools, and for the graduates of individual schools, as well as data for various groups according to their activities in the field of medical practice.

Table 2 shows the age distribution of the graduates of the various years according to five-year periods. This table shows 20.8 per cent of the 1930 graduates to be under thirty years of age six years after graduation as compared with 17.7 per cent and 11.2 per cent for the 1920 and 1925 graduates respectively, and 22.9 per cent for the 1915 graduates. To carry the comparison further, the

table shows that the percentage of 1930 graduates who were thirty-five years of age six years after graduation was larger than for any of the other years studied.

Table 2. Medical college graduates, according to age six years after being graduated: 1915, 1920, 1925, and 1930.

Age Group	1915 graduates*		1920 graduates		1925 graduates		1930 graduates	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All ages	1834	100.0	1947	100.0	3230	100.0	3710	100.0
25 to 29 years	420	22.9	346	17.7	362	11.2	772	20.8
30 to 34 years	1,117	60.9	1288	66.1	2196	68.0	2380	64.2
35 to 39 years	212	11.5	252	12.9	541	16.7	360	9.7
40 to 44 years	58	3.1	37	1.9	75	2.4	89	2.4
45 to 49 years	14	0.8	7	0.4	22	0.7	22	0.6
50 years and older			3	0.2	2	0.1	1	**
Age not reported	13	0.8	14	0.8	32	1.0	86	2.3

*Ages of 1915 graduates have been adjusted to what they would have been if questionnaires had been sent them in 1921 instead of in 1926. Naturally these 1915 age distributions are only approximately correct.

**Less than one-tenth of one per cent.

These figures indicate that the 1930 class graduated at an earlier age than did the 1920 or 1925 classes. This is contrary to the suggestion made in connection with the study of the 1925 graduates that higher standards of admission during recent years had resulted in a definitely increased age at graduation. Further detailed study indicates that students graduate from the Canadian colleges at a somewhat younger age than they do from American colleges.

Distribution

As previously mentioned, the studies of the 1925 and 1930 graduates included those of the Canadian medical colleges. Table 3 shows the 1925 and 1930 graduates of the American and Canadian medical colleges according to the country in which they were practicing six years after graduation.

Table 3. Graduates of American and Canadian medical colleges, according to the country in which they were practicing six years after graduation: 1925 and 1930.

Country	1925 graduates				1930 graduates*			
	American colleges		Canadian colleges		American colleges		Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All countries	2948	100.0	282	100.0	3427	100.0	272	100.0
Continental U. S.	2918	99.0	110	39.0	3363	98.1	66	24.3
Canada	1	**	168	59.6	14	0.4	194	71.3
Outlying U. S. territories	25	0.8	1	0.4	17	0.5	—	—
England	—	—	—	—	1	**	5	1.8
British West Indies	—	—	2	0.7	1	**	3	1.1
Other foreign countries	4	0.1	1	0.4	31	0.9	4	1.5

*Excludes nine graduates of American medical colleges and two graduates of Canadian medical colleges who are not practicing.

**Less than one-tenth of one per cent.

One of the most striking observations in this connection is that 39 per cent of the 1925 graduates of Canadian medical colleges were practicing in the United States six years after graduation while only 24.3 per cent of the 1930 graduates of these colleges were practicing in the United States in 1936. In this connection

Table 4. 1925 and 1930 medical college graduates, according to the states in which they were practicing six years after graduation, compared with the population distribution in 1930.**

State	1925 graduates*		1930 graduates*		1930 population**	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
Continental U. S.	3026*	100.00	3418*	100.0	122,775,046	100.0
Alabama	26	0.9	22	0.6	2,646,248	2.2
Arizona	6	0.2	9	0.3	435,573	0.4
Arkansas	12	0.4	17	0.5	1,854,482	1.5
California	232	7.7	222	6.5	5,677,251	4.6
Colorado	26	0.9	30	0.9	1,035,791	0.8
Connecticut	47	1.6	61	1.8	1,606,903	1.3
Delaware	8	0.2	7	0.2	238,380	0.2
District of Columbia	49	1.6	49	1.4	486,869	0.4
Florida	25	0.8	34	1.0	1,468,211	1.2
Georgia	39	1.3	38	1.1	2,908,506	2.4
Idaho	11	0.4	13	0.4	445,032	0.4
Illinois	213	7.0	189	5.5	7,630,654	6.2
Indiana	68	2.2	76	2.2	3,238,503	2.6
Iowa	43	1.4	70	2.0	2,470,939	2.0
Kansas	24	0.8	49	1.4	1,880,999	1.5
Kentucky	35	1.2	37	1.1	2,614,589	2.1
Louisiana	34	1.1	37	1.1	2,101,593	1.7
Maine	11	0.4	12	0.4	797,423	0.6
Maryland	49	1.6	55	1.6	1,631,526	1.3
Massachusetts	127	4.2	149	4.4	4,249,614	3.5
Michigan	158	5.2	132	3.9	4,842,325	3.9
Minnesota	75	2.5	94	2.8	2,563,953	2.1
Mississippi	10	0.3	23	0.7	2,009,821	1.6
Missouri	64	2.1	90	2.6	3,629,367	3.0
Montana	9	0.3	14	0.4	537,606	0.4
Nebraska	44	1.5	34	1.0	1,377,963	1.1
Nevada	4	0.1	4	0.1	91,058	0.1
New Hampshire	5	0.2	16	0.5	465,293	0.4
New Jersey	124	4.1	130	3.8	4,041,334	3.3
New Mexico	6	0.2	8	0.2	423,317	0.3
New York	521	17.2	605	17.7	12,588,066	10.3
North Carolina	52	1.7	57	1.7	3,170,276	2.6
North Dakota	9	0.3	14	0.4	680,845	0.6
Ohio	178	5.9	205	6.0	6,646,697	5.4
Oklahoma	27	0.9	42	1.2	2,396,040	2.0
Oregon	34	1.1	23	0.7	953,786	0.8
Pennsylvania	227	7.2	268	7.8	9,631,350	7.8
Rhode Island	20	0.7	17	0.5	687,497	0.6
South Carolina	18	0.6	28	0.8	1,738,765	1.4
South Dakota	8	0.3	7	0.2	692,849	0.6
Tennessee	45	1.5	54	1.6	2,616,556	2.1
Texas	95	3.1	128	3.7	5,824,715	4.7
Utah	11	0.4	13	0.4	507,847	0.4
Vermont	7	0.2	10	0.3	359,611	0.3
Virginia	36	1.2	56	1.6	2,421,851	2.0
Washington	34	1.1	31	0.9	1,563,396	1.3
West Virginia	54	1.8	34	1.0	1,729,205	1.4
Wisconsin	52	1.7	97	2.9	2,939,006	2.4
Wyoming	4	0.1	8	0.2	225,565	0.2

*This table excludes 204 physicians who were graduated in 1925 and 281 physicians who were graduated in 1930 who were practicing in outlying U. S. territories, Canada, or other foreign countries.

**Data from the Federal Census of 1930.

it must be borne in mind that a certain number of American students graduate from Canadian medical colleges. Then, too, the decreased tendency on the part of the 1930 graduates of the Canadian medical colleges to locate in the United States may be in part explained on the basis of less attractive opportunities in this country as compared with those available in Canada.

On the contrary, practically all of the graduates of American medical colleges have located in the United States. The increased number of these graduates located in "other foreign countries" is apparently largely explained by an increased number of medical missionaries.

Table 4 shows the 1925 and 1930 graduates practicing in the United States according to the states in which they were practicing six years after graduation compared with the population distribution based on the 1930 census.

A study of this table suggests that the distribution of the graduates is in general on an economic rather than on a population basis. The figures for 1930 suggest an increased tendency on the part of the graduates to locate in the less populous states. Iowa, Kansas, Mississippi, North Dakota, Oklahoma, and Wisconsin are among the states which have attracted a larger number of the 1930 graduates than they did of the 1925 graduates. At the same time, a definitely increased number of 1930 graduates have located in New York State.

In connection with all comparative studies of the data concerning the graduates of the different years it is important to bear in mind that the number of graduates and the number of graduates returning questionnaires was greater for each succeeding year studied. Thus slight percentage differences must be interpreted in terms of the bases from which they are computed. For example, Table 4 shows 0.9 per cent of both 1925 and 1930 graduates located in Colorado six years after graduation, whereas the corresponding absolute numbers are 26 and 30. Any increased percentage for the 1930 graduates, being computed from the larger base, indicates an even greater increase in absolute numbers.

Table 5 shows the distribution of the graduates of the various years according to the size of the community in which they were practicing six years after graduation together with the population distribution based on the 1930 census. This table shows for the 1930 graduates a somewhat lessened tendency to locate in cities with a population of 100,000 and above. However, as would be expected, the percentage of graduates locating in these larger communities is still well above the percentage of the total population residing in them.

Table 6 gives the distribution of the 1925 and 1930 graduates of American and Canadian medical colleges in greater detail. This table shows for the graduates of American medical colleges a definitely smaller percentage of the 1930 graduates locating in all communities of more than 25,000 population as compared with the 1925 graduates. However, as previously mentioned, the comparison of percentages may be somewhat misleading as we are dealing with a larger number of graduates in the 1930 class than in the 1925 class. Thus, although the table indicates only 27.6 per cent of the 1930 graduates of American colleges were located in cities of 500,000 population and over as compared with 32 per cent of the 1925 graduates, the absolute comparable numbers are 946 for the 1930 and 943 for the 1925 graduates. There has apparently been both an absolute and percentage increase in 1930 graduates of American colleges locating in cities of 10,000 to 25,000 population and villages of 5,000 to 10,000 population as compared with the 1925 graduates.

Table 5. Medical college graduates according to the size of the community in which they were practicing six years after graduation and comparison with 1930 census figures: 1915, 1920, 1925, and 1930.

Community	1915 graduates		1920 graduates		1925 graduates		1930* graduates		1930 population	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All communities	1834	100.0	1947	100.0	3230	100.0	3699	100.0	122,775,046	100.0
Cities of 500,000 population and over	516	28.1	616	31.6	1020	31.6	1010	27.3	20,828,542	17.0
Cities of 100,000 to 500,000 population	347	18.9	352	18.1	673	20.8	609	16.5	15,497,194	12.6
Balance of states	940	51.2	943	48.4	1526	47.2	2043	55.2	86,449,310	70.4
Foreign communities (size unknown)	31	1.8	36	1.9	11	0.3	37	1.0	———	——

*Excludes eleven graduates who are not practicing.

Table 6. Graduates of American and Canadian medical colleges, according to the community in which they were practicing six years after graduation: 1925 and 1930.

Community	1925 graduates				1930 graduates*			
	American colleges		Canadian colleges		American colleges		Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All communities	2948	100.0	282	100.0	3427	100.0	272	100.0
Cities of 500,000 population and over	943	32.0	77	27.3	946	27.6	64	23.5
Cities of 100,000 to 500,000 population	638	21.6	35	12.4	576	16.8	33	12.1
Cities of 50,000 to 100,000 population	218	7.4	18	6.4	233	6.8	26	9.6
Cities of 25,000 to 50,000 population	188	6.4	18	6.4	200	5.8	12	4.4
Cities of 10,000 to 25,000 population	256	8.7	22	7.8	343	10.0	15	5.5
Villages of 5,000 to 10,000 population	160	5.4	18	6.4	234	6.8	5	1.8
Communities of less than 5,000	535	18.1	91	32.3	855	24.9	108	39.7
Army and Navy (only address given)	2	0.1	—	——	12	0.4	—	—
Foreign communities (size unknown)	8	0.2	3	1.1	28	0.8	9	3.3

*Excludes nine graduates of American medical colleges and two graduates of Canadian medical colleges who are not practicing.

*Excludes nine graduates of American medical colleges and two graduates of Canadian medical colleges who are not practicing.

Table 7. Graduates of American and Canadian medical colleges who were engaged in private practice, according to community in which they were practicing six years after graduation: 1930.

Community	1930 graduates in private practice					
	All colleges		American colleges		Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All communities	2869	100.0	2666	100.0	203	100.0
Cities of 500,000 population and over	806	28.1	768	28.8	38	18.7
Cities of 100,000 to 500,000 population	454	15.8	429	16.1	25	12.3
Cities of 50,000 to 100,000 population	201	7.0	181	6.8	20	9.9
Cities of 25,000 to 50,000 population	160	5.6	151	5.7	9	4.4
Cities of 10,000 to 25,000 population	254	8.9	245	9.2	9	4.4
Villiages of 5,000 to 10,000 population	204	7.1	200	7.5	4	2.0
Communities of less than 5,000	776	27.0	682	25.6	94	46.3
Army and Navy (only address given)	1	*	1	*	—	—
Foreign communities (size unknown)	13	0.4	9	0.3	4	2.0

*Less than one-tenth of one per cent.

Table 8. Graduates engaged in private and non-private practice in communities of specified size, according to medical college: 1930.

College	Graduates engaged in private practice in communities of specified size										Graduates engaged in non-private practice in communities of specified size									
	Total	500,000 and over	100,000 to 500,000	50,000 to 100,000	25,000 to 50,000	10,000 to 25,000	5,000 to 10,000	Less than 5,000	Army and* Navy	Foreign communities**	Total	500,000 and over	100,000 to 500,000	50,000 to 100,000	25,000 to 50,000	10,000 to 25,000	5,000 to 10,000	Less than 5,000	Army and* Navy	Foreign communities**
All medical colleges	**2869**	**806**	**454**	**201**	**160**	**254**	**204**	**776**	**1**	**13**	**830**	**204**	**155**	**58**	**52**	**104**	**35**	**187**	**11**	**24**
American medical colleges	**2666**	**768**	**429**	**181**	**151**	**245**	**200**	**682**	**1**	**9**	**761**	**178**	**147**	**52**	**49**	**98**	**34**	**173**	**11**	**19**
Albany Medical College	14	—	—	4	1	1	—	8	—	—	—	—	—	—	—	—	—	—	—	—
Univ. of Arkansas School of Med.	10	—	2	2	—	2	—	4	—	—	12	—	4	1	1	—	1	4	1	—
Baylor University College of Med.	57	—	12	—	—	6	11	28	—	—	14	—	7	1	1	3	—	2	—	—
Boston University School of Med.	34	9	3	3	3	4	3	9	—	—	4	1	—	—	—	1	—	2	—	—
University of Buffalo School of Med.	35	18	2	1	1	4	—	9	—	—	5	3	—	1	—	1	—	—	—	—
University of California Med. School	31	12	8	3	1	—	2	5	—	—	6	1	2	1	—	—	—	2	—	—
University of Cincinnati Coll. of Med.	32	—	15	6	—	2	3	6	—	—	11	1	4	—	—	5	—	—	1	—
University of Colorado School of Med.	20	—	6	2	1	3	3	5	—	—	16	—	6	2	2	4	—	1	—	1
Columbia Univ. Coll. of Phys. & Surg.	63	30	5	2	6	11	4	5	—	—	10	5	—	1	—	—	—	4	—	—
Cornell University Medical College	32	18	5	2	2	1	1	3	—	—	10	4	4	—	—	—	—	2	—	—
Creighton University School of Med.	28	6	4	3	1	1	2	11	—	—	7	1	2	—	1	—	1	2	—	—
Emory University School of Medicine	26	—	2	2	2	6	6	7	1	—	10	1	4	—	2	—	—	3	—	—
Georgetown University School of Med.	58	16	17	3	6	5	4	6	—	1	3	1	1	—	—	—	—	—	1	—
George Washington Univ. S. of Med.	25	11	5	—	1	—	1	7	—	—	7	3	2	—	—	—	—	2	—	—
University of Georgia School of Med.	16	—	2	4	—	1	3	6	—	—	9	—	1	2	—	1	2	3	—	—
Hahnemann Medical Coll. and Hosp.	42	13	5	4	1	3	5	11	—	—	5	1	—	1	—	—	1	2	—	—
Harvard University Medical School	72	27	10	6	4	11	5	9	—	—	38	14	7	2	4	3	—	5	1	2
Howard University College of Med.	31	8	11	—	2	5	2	2	—	1	3	—	2	—	—	—	—	1	—	—
University of Illinois College of Med.	68	33	3	5	3	6	3	15	—	—	23	4	3	1	3	4	1	6	1	—
Indiana University School of Med.	55	2	12	2	3	6	5	25	—	—	25	1	3	2	4	4	—	6	—	—
State University of Iowa Coll. of Med.	60	5	6	6	5	3	6	29	—	—	22	4	2	2	1	7	2	3	1	—
Jefferson Med. Coll. of Philadelphia	85	14	13	5	2	13	15	23	—	—	21	8	5	2	2	2	2	—	—	—
Johns Hopkins Univ. School of Med.	33	10	9	2	2	—	5	5	—	—	29	19	3	1	—	3	—	3	—	—
University of Kansas School of Med.	28	—	9	1	2	4	1	11	—	—	9	1	1	1	1	1	1	2	—	1
Long Island College of Medicine	69	57	2	1	2	3	2	2	—	—	2	1	—	—	1	—	—	—	—	—
Univ. of Louisville School of Med.	54	10	5	2	2	6	7	22	—	—	13	2	1	2	—	1	—	6	—	1
Loyola University School of Med.	53	29	2	5	2	2	2	10	—	1	6	1	2	—	—	1	1	—	—	1
Marquette University School of Med.	42	22	1	1	8	2	1	7	—	—	7	1	1	1	1	1	1	2	—	—
University of Maryland School of Med. and College of Phys. & Surg.	53	23	8	3	1	6	—	12	—	—	9	3	—	1	—	—	—	5	—	—
College of Medical Evangelists	36	5	2	1	2	3	5	16	—	2	20	3	4	—	1	3	2	5	—	2
Meharry Medical College	23	5	3	—	—	7	3	5	—	—	2	1	1	—	—	—	—	—	—	—
University of Michigan Med. School	99	28	11	5	11	9	7	27	—	1	27	6	5	2	6	4	—	4	—	—
University of Minnesota Med. School	72	8	26	1	1	5	4	27	—	—	23	3	2	1	1	3	2	10	1	—
University of Nebraska Coll. of Med.	41	4	7	3	—	3	2	22	—	—	18	4	3	1	1	3	1	4	—	1

University of Minnesota Med. School	72	8	26	1	1	5	4	27	—	—	23	3	2	1	1	3	2	10	1	—
University of Nebraska Coll. of Med.	41	4	7	3	—	3	2	22	—	—	18	4	3	1	1	3	1	4	—	1
New York Homeopathic Medical College and Flower Hospital	47	36	1	3	—	2	2	3	—	—	5	2	—	—	—	—	1	1	—	1
New York University College of Med.	85	65	4	4	4	4	—	4	—	—	3	3	—	—	—	—	—	—	—	—
Northwestern University Med. School	69	20	13	5	3	6	2	19	—	1	24	4	4	1	1	5	3	5	1	—
Ohio State University Coll. of Med.	37	4	11	2	3	4	3	10	—	—	10	1	6	—	—	2	—	—	—	1
University of Oklahoma School of M.	29	2	7	1	2	—	4	13	—	—	12	2	3	—	—	—	—	6	—	1
University of Oregon Med. School	24	1	10	—	—	2	1	10	—	—	11	3	2	1	1	2	—	2	—	—
Univ. of Pennsylvania School of M.	77	24	11	9	8	3	9	12	—	1	20	6	1	2	—	4	1	4	—	2
Univ. of Pittsburgh School of Med.	48	14	—	1	—	6	5	22	—	—	6	1	—	—	—	2	1	2	—	—
University of Rochester School of M.	18	5	5	1	1	3	—	3	—	—	4	1	1	1	—	—	—	1	—	—
Rush Med. Coll. (Univ. of Chicago)	67	23	9	6	3	3	7	15	—	1	31	10	5	3	3	2	1	5	1	1
St. Louis Univ. School of Med.	69	31	10	5	7	6	3	7	—	—	17	4	2	3	—	2	—	6	—	—
Medical Coll. of the State of South Carolina	21	1	2	5	4	1	2	6	—	—	6	1	1	1	—	1	—	1	1	—
Stanford Univ. School of Medicine	35	16	4	3	3	2	1	6	—	—	8	4	—	—	1	2	—	1	—	—
Syracuse Univ. College of Medicine	36	4	10	2	4	2	1	13	—	—	3	—	1	—	1	1	—	—	—	—
Temple Univ. School of Medicine	31	12	1	4	—	4	2	8	—	—	4	1	—	—	—	—	1	2	—	—
Univ. of Tennessee Coll. of Medicine	44	7	14	1	1	3	4	14	—	—	16	—	2	1	—	—	2	11	—	—
Univ. of Texas School of Medicine	26	1	9	2	1	5	3	5	—	—	6	—	2	—	—	2	1	—	—	1
Tufts College Medical School	67	15	16	8	9	6	2	11	—	—	14	3	—	—	1	3	—	7	—	—
Tulane Univ. of Louisiana School of Medicine	54	3	12	4	3	5	4	23	—	—	16	1	5	—	2	3	—	5	—	—
Vanderbilt Univ. School of Medicine	18	—	7	1	—	4	4	2	—	—	15	4	4	—	1	1	—	5	—	—
Univ. of Vermont Coll. of Medicine	19	3	3	1	—	6	1	5	—	—	2	1	—	—	—	—	—	1	—	—
Medical College of Virginia	52	6	9	5	2	3	3	24	—	—	23	3	6	2	2	3	2	5	—	—
Univ. of Virginia Dept. of Medicine	29	1	11	2	2	5	4	4	—	—	15	1	5	2	1	1	1	4	—	—
Washington Univ. School of Medicine	42	9	6	5	1	2	4	15	—	—	16	6	1	1	1	2	1	2	1	1
Wayne University Coll. of Medicine	35	16	1	2	—	2	2	12	—	—	5	1	—	—	—	3	1	—	—	—
Western Reserve Univ. School of M.	37	12	2	4	6	4	2	7	—	—	15	7	4	2	—	—	—	2	—	—
Univ. of Wisconsin Med. School	20	2	—	5	3	3	—	7	—	—	8	3	—	1	1	2	—	1	—	—
Woman's Med. Coll. of Pennsylvania	7	3	1	—	1	1	1	—	—	—	3	—	—	—	—	—	1	—	—	2
Yale Univ. School of Medicine	26	9	7	—	2	4	1	3	—	—	17	7	5	2	—	—	—	3	—	—
Canadian medical colleges	203	38	25	20	9	9	4	94	—	4	69	26	8	6	3	6	1	14	—	5
Univ. of Alberta Faculty of Medicine	13	—	1	2	1	—	—	8	—	1	4	—	—	2	—	—	—	2	—	—
Dalhousie Univ. Faculty of Medicine	11	—	—	4	—	1	—	5	—	1	2	—	—	1	—	—	—	—	—	1
Laval Univ. Faculty of Medicine	24	1	6	—	—	2	—	15	—	—	—	—	—	—	—	—	—	—	—	—
Univ. of Manitoba Faculty of Med.	20	—	5	—	1	—	—	14	—	—	4	1	1	—	—	1	—	—	—	1
McGill Univ. Faculty of Medicine	39	11	5	7	4	2	1	8	—	1	17	7	1	1	2	3	—	2	—	1
Univ. of Montreal Faculty of Med.	21	9	—	—	1	—	—	11	—	—	5	3	—	—	—	—	—	2	—	—
Queen's Univ. Faculty of Medicine	20	1	5	1	—	4	1	7	—	1	10	3	1	—	—	1	—	5	—	—
Univ. of Toronto Faculty of Medicine	40	15	3	1	1	—	2	18	—	—	24	10	4	2	1	1	1	3	—	2
Univ. of Western Ontario Med. School	15	1	—	5	1	—	—	8	—	—	3	2	1	—	—	—	—	—	—	—

*Only address given
**Size of community unknown

Table 9. Number and percentage of 1930 medical college graduates who are practicing in the same state and in the same city as in college, according to medical college.**

College	1930 graduates*														
	Engaged in all phases of medical practice					Engaged in private practice					Engaged in non-private practice				
		In same state as college		In same-city as college**			In same state as college		In same city as college**			In same state as college		In same city as college**	
	Total	Number	Per cent of total	Number	Per cent of total	Total	Number	Per cent of total	Number	Per cent of total	Total	Number	Per cent of total	Number	Per cent of total
American medical colleges	3427	1729	50.5	647	18.8	2666	1486	55.7	548	20.6	761	243	31.9	99	13.0
Albany Medical College	14	11	***	—	—	14	11	***	—	—	—	—	—	—	—
University of Arkansas School of M.	22	7	***	—	—	10	5	***	—	—	12	2	***	—	—
Baylor University College of Medicine	71	51	71.8	—	—	57	48	84.2	—	—	14	3	***	—	—
Boston University School of Medicine	38	17	44.7	5	13.2	34	16	47.1	5	14.7	4	1	***	—	—
University of Buffalo School of Med.	40	36	90.0	19	47.5	35	33	94.3	16	45.7	5	3	***	3	***
University of California Med. School	37	32	86.5	12	32.4	31	29	93.5	11	35.5	6	3	***	1	***
University of Cincinnati Coll. of Med.	43	29	67.4	13	30.2	32	24	66.7	11	34.4	11	5	***	2	***
University of Colorado School of Med.	36	13	36.1	1	2.8	20	10	***	—	—	16	3	***	1	***
Columbia Univ. C. of Phys. & Surgs.	73	53	72.6	33	45.2	63	46	73.0	29	46.0	10	7	***	4	***
Cornell University Medical College	42	30	71.4	20	47.6	32	24	66.7	17	53.1	10	6	***	3	***
Creighton University School of Med.	35	7	20.0	3	8.6	28	5	17.9	2	7.2	7	2	***	1	***
Emory University School of Medicine	36	12	33.3	2	5.6	26	10	38.5	1	3.8	10	2	***	1	***
Georgetown University School of M.	61	6	9.8	6	9.8	58	6	10.3	6	10.3	3	—	—	—	—
George Washington University School of Medicine	32	5	15.6	5	15.6	25	3	12.0	3	12.0	7	2	***	2	***
University of Georgia School of Med.	25	14	56.0	1	4.0	16	9	***	1	***	9	5	***	—	—
Hahnemann Med. Coll. and Hospital	47	24	51.1	7	14.9	42	23	54.8	7	16.7	5	1	***	—	—
Harvard University Medical School	110	46	41.8	24	21.8	72	36	50.0	16	22.2	38	10	26.3	8	21.1
Howard University College of Med.	34	—	—	—	—	31	—	—	—	—	3	—	—	—	—
University of Illinois College of Med.	91	53	58.2	—	—	68	48	70.6	—	—	23	5	***	—	—
Indiana University School of Med.	80	58	72.5	—	—	55	44	80.0	—	—	25	14	56.0	—	—
State Univ. of Iowa College of Med.	82	40	48.8	5	6.1	60	34	56.7	1	1.7	22	6	***	4	***
Jefferson Med. Coll. of Philadelphia	106	54	50.9	11	10.4	85	48	56.5	9	10.6	21	6	***	2	***
Johns Hopkins Univ. School of Med.	62	15	24.2	15	24.2	33	4	12.1	4	12.1	29	11	37.9	11	37.9
University of Kansas School of Med.	37	9	24.3	—	—	28	8	28.6	—	—	9	1	***	—	—
Long Island College of Medicine	71	64	90.1	58	81.7	69	62	89.9	57	82.6	2	2	***	1	***
University of Louisville School of M.	67	23	34.3	4	6.0	54	22	40.7	4	7.4	13	1	***	—	—
Loyola University School of Medicine	59	33	55.9	24	40.7	53	31	58.5	24	45.3	6	2	***	—	—
Marquette University School of Med.	49	38	77.6	21	42.9	42	37	88.1	20	47.6	7	1	***	1	***
Univ. of Maryland School of Medicine and Coll. of Physicians & Surgeons	62	16	25.8	11	17.7	53	14	26.4	10	18.9	9	2	***	1	***
College of Medical Evangelists	56	29	51.8	1	1.8	36	18	50.0	—	—	20	11	***	1	***
Meharry Medical College	25	3	12.0	2	8.0	23	2	***	1	***	2	1	***	1	***
University of Michigan Med. School	126	64	50.8	7	5.6	99	53	53.5	3	3.0	27	11	40.7	4	14.8
University of Minnesota Med. School	95	51	53.7	24	25.3	72	47	65.3	23	31.9	23	4	***	1	***
University of Nebraska Coll. of Med.	59	23	39.0	3	5.1	41	21	51.2	3	7.3	18	2	***	—	—
New York Homeopathic Medical															

Meharry Medical College	25	3	12.0	2	8.0	23	2	8.7	1	4.3	21	1	4.8	1	4.8
University of Michigan Med. School	126	64	50.8	7	5.6	99	53	53.5	3	3.0	27	11	40.7	4	14.8
University of Minnesota Med. School	95	51	53.7	24	25.3	72	47	65.3	23	31.9	23	4	***	1	***
University of Nebraska Coll. of Med.	59	23	39.0	3	5.1	41	21	51.2	3	7.3	18	2	***	—	—
New York Homeopathic Medical College and Flower Hospital	52	46	88.5	37	71.3	47	44	93.6	36	76.6	5	2	***	1	***
New York University College of Med.	88	71	80.7	68	77.3	85	68	80.0	65	76.5	3	3	***	3	***
Northwestern University Med. School	93	27	29.0	16	17.2	69	21	30.4	13	18.8	24	6	***	3	***
Ohio State University College of Med.	47	38	80.9	11	23.4	37	34	91.9	7	18.9	10	4	***	4	***
University of Oklahoma School of M.	41	17	41.5	—	—	29	16	55.2	—	—	12	1	***	—	—
University of Oregon Medical School	35	15	42.9	2	5.7	24	11	***	—	—	11	4	***	2	***
Univ. of Pennsylvania School of Med.	97	41	42.3	21	21.6	77	34	44.2	17	22.1	20	7	***	4	***
University of Pittsburgh School of M.	54	49	90.7	15	27.8	48	45	93.8	14	29.2	6	4	***	1	***
University of Rochester School of M.	22	10	***	3	***	18	9	***	3	***	4	1	***	—	—
Rush Medical Coll. (Univ. of Chicago)	98	34	34.7	25	25.5	67	24	35.8	17	25.4	31	10	32.3	8	25.8
St. Louis University School of Med.	86	31	36.0	16	18.6	69	22	33.3	13	56.5	17	8	***	3	***
Medical College of the State of South Carolina	27	19	70.4	2	7.4	21	17	***	2	***	6	2	***	—	—
Stanford University School of Med.	43	35	81.4	—	—	35	32	91.4	—	—	8	3	***	—	—
Syracuse University College of Med.	39	31	79.5	7	17.9	36	29	80.6	6	16.7	3	2	***	1	***
Temple University School of Medicine	35	27	77.1	9	25.7	31	23	74.2	8	25.8	4	4	***	1	***
University of Tennessee Coll. of Med.	60	26	43.3	3	5.0	44	19	43.2	2	4.5	16	7	***	1	***
University of Texas School of Med.	32	25	78.1	1	3.1	26	22	84.6	1	3.8	6	3	***	—	—
Tufts College Medical School	81	45	55.6	10	12.3	67	39	58.2	10	14.9	14	6	***	—	—
Tulane University of Louisiana School of Medicine	70	20	28.6	5	7.1	54	18	33.3	5	9.3	16	2	***	—	—
Vanderbilt University School of Med.	33	6	18.2	2	6.1	18	4	***	1	***	15	2	***	1	***
University of Vermont College of M.	21	7	***	1	***	19	7	***	1	***	2	—	—	—	—
Medical College of Virginia	75	13	17.3	7	9.3	52	6	11.5	4	7.7	23	7	***	3	***
University of Virginia Dept. of Med.	44	7	15.9	1	2.3	29	5	17.2	1	3.4	15	2	***	—	—
Washington University School of M.	58	19	32.8	9	15.5	42	16	38.1	6	14.3	16	3	***	3	***
Wayne University College of Med.	40	35	87.5	15	37.5	35	33	94.3	15	42.9	5	2	***	—	—
Western Reserve Univ. School of M.	52	34	65.4	11	21.2	37	27	73.0	8	21.6	15	7	***	3	***
University of Wisconsin Med. School	28	18	64.3	6	21.4	20	16	***	5	***	8	2	***	1	***
Woman's Med. Coll. of Pennsylvania	10	4	***	3	***	7	4	***	3	***	3	—	—	—	—
Yale University School of Medicine	43	13	30.2	4	9.3	26	9	34.6	1	3.8	17	4	***	3	***
Canadian medical colleges	272	152	55.9	68	25.0	203	118	58.1	51	25.1	69	34	49.3	17	24.6
University of Alberta Faculty of Med.	17	9	***	4	***	13	6	***	2	***	4	3	***	2	***
Dalhousie University Faculty of Med.	13	7	***	5	***	11	6	***	4	***	2	1	***	1	***
Laval University Faculty of Medicine	24	20	***	6	***	24	20	***	6	***	—	—	—	—	—
University of Manitoba Faculty of M.	24	9	***	5	***	20	8	***	4	***	4	1	***	1	***
McGill University Faculty of Medicine	56	13	23.2	10	17.9	39	9	23.1	6	15.4	17	4	***	4	***
University of Montreal Faculty of M.	26	23	88.5	14	53.8	21	18	***	11	***	5	5	***	3	***
Queen's University Faculty of Med.	30	14	46.7	—	—	20	9	***	—	—	10	5	***	—	—
University of Toronto Faculty of M.	64	43	67.2	19	29.7	40	29	72.5	13	32.5	24	14	***	6	***
Univ. of Western Ontario M. School	18	14	***	5	***	15	13	***	5	***	3	1	***	—	—
All medical colleges	3699	1881	50.9	715	19.3	2369	1604	55.9	599	20.9	830	277	33.4	116	14.0

*Excludes 9 graduates of American medical colleges and 2 graduates of Canadian colleges who are not practicing.
**In this table a liberal interpretation of the "same city" has been made. For instance, both St. Paul and Minneapolis have been considered as the "same city" as in the case of the University of Minnesota which is located between these two cities. Medical colleges located in suburbs of large cities have been considered part of the larger city.
***Per cent not shown when case is less than 25.

The most interesting trend shown in this table has to do with the locating of graduates in the more rural districts, that is, in the communities of less than 5,000 population. Of the 1930 graduates of American medical colleges, 24.9 per cent or 855 located in such rural areas as compared with 18.1 per cent or 535 of the 1925 graduates.

Data for the graduates of the Canadian medical colleges show some trend away from the metropolitan centers, and a somewhat larger number of the 1930 graduates locating in the rural districts as compared with the 1925 graduates of these colleges. However, the number of graduates of Canadian colleges for which we have data is relatively small and interpretations are somewhat difficult.

In order to eliminate from this picture all of the graduates in institutional work and in full-time paid positions, a table was prepared showing the distribution of the 1930 graduates who are engaged in the private practice of medicine. As shown in Table 7, 27 per cent of all the 1930 graduates who are engaged in private practice are located in communities of less than 5,000. Apparently a definitely larger percentage of the graduates of Canadian colleges who are in private practice have located in communities of less than 5,000 population than have similar graduates of American colleges.

Table 8 shows for the individual medical colleges the number of 1930 graduates engaged in the private and non-private practice of medicine according to the size of the communities in which they are located.

Table 9 shows for the individual colleges the number and percentage of 1930 graduates who are practicing in the same state and in the same city as that in which the college is located. The first five columns deal with the graduates as a whole, and the remainder of the table shows separate data for those engaged in the private practice of medicine and those engaged in non-private practice. The table indicates that the University of Buffalo School of Medicine, Long Island College of Medicine, and the University of Pittsburgh School of Medicine show the largest percentage of 1930 graduates practicing in the same state as that in which the college is located. Long Island College of Medicine, New York Homeopathic Medical College and Flower Hospital, and New York University College of Medicine show the largest percentage practicing in the same city as that in which the college is located.

Table 10 shows the 1925 and 1930 graduates who are practicing in cities of 500,000 population and over according to the cities in which they are practicing, together with the population in such cities based on the 1930 census. Chicago and Detroit definitely attracted smaller percentages of the 1930 graduates practicing in the larger cities than they did of the 1925 graduates. The economic situation in Detroit during the past few years is probably reflected in the small number of 1930 graduates practicing there. New York City apparently continues to attract a large percentage of graduates which is out of proportion to the city's population. Of the 1930 graduates locating in New York City, 216 of the 393 were graduates of the five medical colleges located in that city.

Table 10. Medical college graduates practicing in cities of 500,000 population and over and the population distribution in such cities in 1930*: 1925 and 1930.

City	1925 graduates		1930 graduates		Population: 1930*	
	Number	Per cent distribution	Number**	Per cent distribution	Number	Per cent distribution
All large cities	1020	100.0	1002	100.0	22,267,049	100.0
Baltimore	35	3.4	39	3.9	804,874	3.6
Boston	54	5.3	48	4.8	781,188	3.5
Buffalo	26	2.6	23	2.3	573,076	2.6
Chicago	139	13.6	109	10.9	3,376,438	15.2
Cleveland	32	3.1	41	4.1	900,429	4.0
Detroit	82	8.0	40	4.0	1,568,662	7.0
Los Angeles	52	5.1	45	4.5	1,238,048	5.6
Milwaukee	26	2.6	33	3.3	578,249	2.6
Montreal	26	2.6	30	3.0	810,925	3.6
New York City	340	33.3	393	39.2	6,930,446	31.1
Philadelphia	77	7.5	71	7.1	1,950,961	8.8
Pittsburgh	32	3.1	29	2.9	669,817	3.0
San Francisco	46	4.5	43	4.3	634,394	2.8
St. Louis	33	3.2	34	3.4	821,960	3.7
Toronto	20	2.0	24	2.4	627,582	2.8

*The population of cities in the United States is given in accordance with the Federal Census of 1930, while that for Canadian cities is taken from the Canadian Census of 1931.

**Excludes eight graduates who are practicing in large cities abroad, principally London.

Types of Practice

Table 11 classifies the graduates of the various years according to the type of practice in which they are engaged. The classification used for type of practice was as follows: general practice; general practice but giving special attention to a specialty; definite limitation of practice to a special field.

This table shows for each successive five-year group an increasing percentage engaged in general practice. There is evidence of no definite trend as far as the group "general practice with special attention to a specialty" is concerned. In regard to those who have limited their practice to a specialty, for each successive group of graduates there is a smaller percentage with only 30.4 per cent of the 1930 graduates limiting to a specialty. However, it must again be pointed out that with each successive group we are dealing with a larger number of graduates, and although percentages may show trends, we must consider the absolute numbers involved. Although, as mentioned, there is for each succeeding group studied a progressive decrease in the percentage of graduates limiting their practice to a specialty, the actual number so limiting their practice has progressively increased since 1920. Table 12 shows a similar tabulation of 1925 and 1930 graduates of American and Canadian medical colleges.

In the questionnaires, graduates who had not limited their practice to a specialty were asked to indicate their plans in regard to specialization. On this basis Table 13 was prepared and shows for the various years the number and percentage who will eventually limit their practice to a specialty if their plans are carried out. Thus, although largely speculative, this table does throw some light on the tendencies toward specialization. There is indicated a progressive increase in the absolute number of graduates eventually limiting their practice to a specialty although the indicated percentage for the 1930 graduates is lower than that for any of the preceding years studied.

Table 14 shows the number and percentage of 1925 and 1930 graduates

Table 11. Medical college graduates*, according to type of practice: 1915, 1920, 1925, and 1930.

Type of practice	All* graduates		1915 graduates		1920 graduates		1925 graduates		1930 graduates	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All types	10721	100.0	1834	100.0	1947	100.0	3230	100.0	3710	100.0
General practice	2855	26.6	412	22.5	464	23.8	811	25.1	1168	31.5
General practice with special attention to specialty	4151	38.7	653	35.6	786	40.4	1307	40.5	1405	37.9
Limited to specialty	3656	34.1	751	40.9	682	35.0	1097	34.0	1126	30.4
Not practicing	59	0.6	18	1.0	15	0.8	15	0.5	11	0.3

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

Table 12. 1925 and 1930 graduates of American and Canadian medical colleges, according to type of practice six years after graduation.

Type of practice	1925 graduates				1930 graduates			
	American colleges		Canadian colleges		American colleges		Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All types	2948	100.0	282	100.0	3436	100.0	274	100.0
General practice	728	24.7	83	29.4	1079	31.4	89	32.5
General practice with special attention to specialty	1205	40.9	102	36.2	1314	38.2	91	33.2
Limited to specialty	1001	34.0	96	34.0	1034	30.1	92	33.6
Not practicing	14	0.5	1	0.4	9	0.3	2	0.7

Table 13. Medical college graduates* who have limited their practice and those who will limit eventually, according to type of practice and plans for limitation: 1915, 1920, 1925, and 1930.

Type of practice and plans for limiting practice	1915 graduates	1920 graduates	1925 graduates	1930 graduates
All graduates	1834	1947	3230	3699
Graduates limiting their practice at time* of study	751	682	1097	1126
Graduates giving special attention to specialty who plan limitation eventually	365	544	826	892
Graduates engaged in general practice who plan limitation eventually	100	180	344	375
Graduates who have limited their practice and who plan to limit eventually	1216	1406	2267	2393
Percentage of graduates specializing eventually	66.3	72.2	70.2	64.7

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

located in cities of 500,000 population and over who limited their practice to a specialty within six years after graduation. Considering the relatively small numbers involved, the percentages limiting to a specialty in the individual communities are quite uniform for the graduates of the two years. For example, a relatively larger percentage of the graduates of both 1925 and 1930 who located in Balti-

Table 14. Number and percentage of medical college graduates who have limited their practice to a specialty six years after graduation in cities of 500,000 population and over: 1925 and 1930.

City	1925 graduates			1930 graduates		
	Total	Limited to specialty		Total	Limited to specialty	
		Number	Per cent of total		Number	Per cent of total
All large cities	1020	409	40.1	1010	387	38.3
Baltimore	35	24	68.6	39	31	79.5
Boston	54	41	75.9	48	35	72.9
Buffalo	26	7	26.9	23	5	*
Chicago	139	60	43.2	109	34	31.2
Cleveland	32	13	40.6	41	19	46.3
Detroit	82	33	40.2	40	9	22.5
Los Angeles	52	27	51.9	45	22	48.9
Milwaukee	26	6	23.1	33	9	27.3
Montreal	26	13	50.0	30	23	76.7
New York City	340	100	29.4	393	106	27.0
Philadelphia	77	19	24.7	71	27	38.0
Pittsburgh	32	14	43.8	29	11	37.9
San Francisco	46	27	58.7	43	21	48.8
St. Louis	33	17	51.5	34	13	38.2
Toronto	20	8	*	24	15	*
Foreign cities	—	—	—	8	7	*

*Per cent not shown when base is less than twenty-five.

more and Boston have limited their practice to a specialty. The fact that both of these cities are training centers for graduates may be an influencing factor resulting in these high percentages. Certain of the graduates were undoubtedly still in training in their specialties at the time the data were collected. On the other hand, a relatively small percentage of both 1925 and 1930 graduates locating in New York City, Philadelphia, Milwaukee, and Buffalo have limited their practice. There is indicated a marked increase in tendency toward specialization for the 1930 graduates who have located in Montreal.

The decreased number locating in Detroit and the smaller number of 1930 graduates limiting to a specialty is probably due to temporary economic conditions especially affecting that city.

Table 15 indicates for the individual colleges in all of the years studied the number and percentage of graduates who have limited their practice to a specialty six years after graduation. The combined data for all of the graduates of the various years are given in the first three columns of this table. The percentages limiting to a specialty have been fairly consistent in the different studies. For the group as a whole, Johns Hopkins University School of Medicine has shown the largest percentage (75.3%) limiting to a specialty within six years after graduation. Harvard University Medical School, Stanford University School of Medicine, University of Virginia Department of Medicine, and Yale University School of Medicine show more than 50 per cent similarly limiting their practice. Only one of the 79 graduates of Meharry Medical College returning question-

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

Table 15. Number and percentage of medical college graduates* who have limited their practice to a specialty, according to college: 1915, 1920, 1925, and 1930.

College	All graduates			1915 graduates			1920 graduates			1925 graduates			1930 graduates		
	Total	Limited to specialty		Total	Limited to specialty		Total	Limited to specialty		Total	Limited to specialty		Total	Limited to specialty	
		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total		Number	Per cent of total
All colleges	10710	3656	34.1	1834	751	40.9	1947	682	35.0	2230	1097	34.0	3699	1126	30.4
Albany Medical College	81	28	34.6	38	15	39.5	16	7	**	13	6	**	14	—	—
University of Arkansas School of M.	54	14	25.9	11	3	**	—	—	—	21	5	**	22	6	**
Baylor University College of Med.	129	37	28.7	10	3	**	23	7	**	25	8	32.0	71	19	26.8
Boston University School of Medicine	96	29	30.2	14	7	**	8	3	**	36	10	27.8	38	9	23.7
University of Buffalo School of Med.	162	39	24.1	42	15	35.7	42	10	23.8	38	7	18.4	40	7	17.5
University of California Med. School	104	35	33.7	10	6	**	15	7	**	42	12	28.6	37	10	27.0
University of Cincinnati Coll. of Med.	100	45	45.0	***	—	—	***	—	—	57	24	42.1	43	21	48.8
University of Colorado School of M.	84	32	38.1	7	3	**	15	6	**	26	11	42.3	36	12	33.3
Columbia University College of Physicians and Surgeons	288	106	36.8	62	29	46.8	76	28	36.8	77	27	35.1	73	22	30.1
Cornell University Medical College	122	50	41.0	10	6	**	29	11	37.9	41	15	36.6	42	18	42.9
Creighton University School of Med.	113	28	24.8	30	6	20.0	20	4	**	28	9	32.1	35	9	25.7
Emory University School of Medicine	207	65	31.4	98	33	33.7	24	9	**	49	16	32.7	36	7	19.4
Georgetown University School of M.	120	32	26.7	21	10	**	9	2	**	39	10	34.5	61	10	16.4
George Washington University School of Medicine	102	38	37.3	18	6	**	16	6	**	36	18	50.0	32	8	25.0
University of Georgia School of Med.	65	20	30.8	8	2	**	13	6	**	19	4	**	25	8	32.0
Hahnemann Medical Coll. and Hosp.	122	16	13.1	14	3	**	26	4	15.4	35	4	11.4	47	5	10.6
Harvard University Medical School	344	211	61.3	64	42	65.6	74	41	55.4	96	67	69.8	110	61	55.5
Howard University College of Med.	99	6	6.1	11	1	**	13	2	**	41	—	—	34	3	8.8
University of Illinois College of Med.	271	80	29.5	50	17	34.0	47	13	27.7	83	26	31.3	91	24	26.4
Indiana University School of Med.	210	65	31.0	26	12	46.2	31	9	29.0	73	24	32.9	80	20	25.0
State University of Iowa Coll. of M.	215	88	40.9	20	11	**	45	16	35.6	68	38	55.9	82	23	28.0
Jefferson Med. Coll. of Philadelphia	441	118	26.8	105	40	38.1	130	30	23.1	100	17	17.0	106	31	29.2
Johns Hopkins Univ. School of Med.	279	210	75.3	73	56	76.7	84	64	76.2	60	43	71.7	62	47	75.8
University of Kansas School of Med.	84	23	27.4	8	5	**	16	4	**	23	8	**	37	6	16.2
Long Island College of Medicine	251	37	14.7	52	15	28.8	55	8	14.5	73	9	12.3	71	5	7.0
University of Louisville School of M.	173	43	24.9	39	12	30.8	16	2	**	51	12	23.5	67	17	25.4
Loyola University School of Medicine	89	15	16.9	***	—	—	***	—	—	30	7	23.3	59	8	13.6
Marquette University School of Med.	109	20	18.3	20	5	**	11	6	**	29	2	6.9	49	7	14.3
Univ. of Maryland School of Medicine and Coll. of Physicians & Surgeons	216	67	31.0	49	18	36.7	43	17	39.5	62	14	22.6	62	18	29.0
College of Medical Evangelists	127	20	15.7	9	3	**	12	1	**	50	5	10.0	56	11	19.6
Meharry Medical College	79	1	1.3	25	—	—	10	—	—	19	—	—	25	1	4.0
University of Michigan Med. School	340	141	41.5	35	22	62.9	58	22	37.9	121	49	40.5	126	48	38.1
University of Minnesota Med. School	255	95	37.3	30	12	40.0	58	26	44.8	72	33	45.8	95	24	25.3
University of Nebraska College of M.	184	50	27.2	7	2	**	37	7	18.9	81	22	27.2	59	19	32.2

University of Michigan Med. School	340	141	41.5	35	22	62.9	58	22	37.9	121	49	40.5	126	48	38.1
University of Minnesota Med. School	255	95	37.3	30	12	40.0	58	26	44.8	72	33	45.8	95	24	25.3
University of Nebraska College of M.	184	50	27.2	7	2	**	37	7	18.9	81	22	27.2	59	19	32.2
New York Homeopathic Medical College and Flower Hospital	68	8	11.8	***	—	—	***	—	—	16	1	**	52	7	13.5
New York University College of Med.	305	70	23.0	71	28	39.4	72	11	15.3	74	16	21.6	88	15	17.0
Northwestern University Med. School	254	92	36.2	29	13	44.8	52	19	36.5	80	28	35.0	93	32	34.4
Ohio State University College of M.	164	43	26.2	35	16	45.7	20	5	**	62	13	21.0	47	9	19.1
University of Oklahoma School of M.	84	24	28.6	13	4	**	11	4	**	19	9	**	41	7	17.1
University of Oregon Medical School	97	38	39.2	10	3	**	10	3	**	42	16	38.1	35	16	45.7
Univ. of Pennsylvania School of M.	346	131	37.9	46	24	52.2	103	34	33.0	100	40	40.0	97	33	34.0
Univ. of Pittsburgh School of Med.	130	31	23.8	9	3	**	31	10	32.3	36	9	25.0	54	9	16.7
University of Rochester School of M.	22	14	**	***	—	—	***	—	—	***	—	—	22	14	**
Rush Medical Col. (Univ. of Chicago)	343	148	43.1	73	35	47.9	85	41	48.2	87	33	38.0	98	39	39.8
St. Louis University School of Med.	233	66	28.3	33	18	54.5	49	11	22.4	65	16	24.6	86	21	24.4
Medical College of the State of South Carolina	84	35	41.7	19	8	**	12	3	**	26	12	46.2	27	12	44.4
Stanford University School of Med.	95	50	52.6	14	5	**	16	9	**	22	15	**	43	21	48.8
Syracuse University College of Med.	120	34	28.3	12	5	**	34	14	41.2	35	8	22.9	39	7	17.9
Temple University School of Med.	64	8	12.5	***	—	—	***	—	—	29	4	13.8	35	4	11.4
University of Tennessee Coll. of Med.	161	64	39.8	43	17	39.5	11	7	**	47	19	40.4	60	21	35.0
University of Texas School of Med.	154	64	41.6	29	15	51.7	47	17	36.2	46	23	50.0	32	9	28.1
Tufts College Medical School	248	66	26.6	38	11	29.0	50	11	22.0	79	24	30.4	81	20	24.7
Tulane University of Louisiana School of Medicine	253	90	35.6	59	20	33.9	58	22	37.9	66	24	36.4	70	24	34.3
Vanderbilt University School of Med.	145	64	44.1	59	25	42.4	18	6	**	35	14	40.0	33	19	57.6
University of Vermont Coll. of Med.	98	32	32.7	32	12	37.5	21	5	**	24	8	**	21	7	**
Medical College of Virginia	199	67	33.7	63	19	30.2	16	6	**	45	17	37.8	75	25	33.3
University of Virginia Dept. of Med.	135	82	60.7	20	13	**	26	19	73.1	45	24	53.3	44	26	59.1
Washington University School of M.	179	79	44.1	28	9	32.1	37	18	48.6	56	28	50.0	58	24	41.4
Wayne University College of Med.	119	27	22.7	28	5	17.9	29	9	31.0	22	5	**	40	8	20.0
Western Reserve Univ. School of M.	158	59	37.3	30	13	43.3	44	13	29.5	32	12	37.5	52	21	40.4
University of Wisconsin Med. School	28	10	35.7	***	—	—	***	—	—	***	—	—	28	10	35.7
Woman's Med. Coll. of Pennsylvania	52	10	19.2	18	5	**	7	2	**	17	3	**	10	—	—
Yale University School of Medicine	103	58	56.3	7	5	**	16	5	**	37	18	48.6	43	30	69.8
American medical colleges	10156	3468	34.1	1834	751	40.9	1947	682	35.0	2948	1001	34.0	3427	1034	30.2
Canadian medical colleges	554	188	33.9	***	—	—	***	—	—	382	96	34.0	272	92	33.8
University of Alberta Faculty of M.	24	5	**	—	—	—	—	—	—	7	1	**	17	4	**
Dalhousie University Faculty of Med.	41	11	26.8	—	—	—	—	—	—	28	9	32.1	13	2	**
Laval University Faculty of Med.	41	12	29.3	—	—	—	—	—	—	17	6	**	24	6	**
University of Manitoba Faculty of M.	54	14	25.9	—	—	—	—	—	—	30	8	26.7	24	6	**
McGill University Faculty of Med.	115	45	39.1	—	—	—	—	—	—	59	23	39.0	56	22	39.3
University of Montreal Faculty of M.	65	26	40.0	—	—	—	—	—	—	39	16	41.0	26	10	38.5
Queen's University Faculty of Med.	30	10	33.3	—	—	—	—	—	—	***	—	—	30	10	33.3
University of Toronto Faculty of M.	150	61	40.7	—	—	—	—	—	—	86	31	36.0	64	30	46.9
Univ. of Western Ontario M. School	24	4	11.8	—	—	—	—	—	—	16	2	**	18	2	**

*The 1915 graduates were studied 11 years after graduation; all subsequent classes were studied six years after graduation.
**Per cent not shown when base is less than 25.
***Not included in the study for this year.

naires had limited his practice to a specialty, and less than 15 per cent of the graduates of Hahnemann Medical College and Hospital of Philadelphia, Howard University College of Medicine, Long Island College of Medicine, New York Homeopathic Medical College and Flower Hospital, Temple University School of Medicine, and University of Western Ontario Medical School had limited their practice.

Private Practice

In connection with the study of the 1930 graduates, information was secured in regard to whether or not the graduates were engaged in the private practice of medicine. A total of 830 or 22.4 per cent of the graduates of 1930 were considered as not engaged in private practice. The basis for this consideration is indicated in Table 16.

Table 16. 1930 graduates of American and Canadian medical colleges who are not engaged in private practice, according to their statements regarding practice.

Statement regarding practice	All 1930 graduates		1930 graduates of American colleges		1930 graduates of Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
Total	830	100.0	761	100.0	69	100.0
No private practice* at present	544	65.5	505	66.4	39	56.5
Apparently no private practice	3	0.4	2	0.3	1	1.4
Never practiced privately	229	27.6	205	26.9	24	34.8
Group practice	54	6.5	49	6.4	5	7.3

*Presumably many of these physicians have never engaged in private practice, though they failed to state that this is the case. Some, however, indicated that they had done private practice for a period prior to taking a full-time position or graduate study. The majority in this group merely stated that they were not engaged in private practice at present.

Table 17 shows for the individual colleges the number and percentage of the 1930 graduates who are engaged in the private practice of medicine. Of the American colleges, University of Colorado School of Medicine, Johns Hopkins University School of Medicine, and Vanderbilt University School of Medicine

Table 17. Number and percentage of 1930 medical college graduates who are engaged in private practice, according to college.

College	1930 graduates*		
	Total	Engaged in private practice	
		Number	Per cent of total
American Colleges	3427	2666	77.8
Albany Medical College	14	14	—
University of Arkansas School of Medicine	22	10	**
Baylor University College of Medicine	71	57	80.3
Boston University School of Medicine	38	34	89.5
University of Buffalo School of Medicine	40	35	87.5
University of California Medical School	37	31	83.8
University of Cincinnati College of Medicine	43	32	74.4
University of Colorado School of Medicine	36	20	55.6
Columbia University College of Physicians & Surgeons	73	63	86.3
Cornell University Medical School	42	32	76.2
Creighton University School of Medicine	35	28	80.0
Emory University School of Medicine	36	26	72.2
Georgetown University School of Medicine	61	58	95.1
George Washington University School of Medicine	32	25	78.1
University of Georgia School of Medicine	25	16	64.0
Hahnemann Medical College and Hospital	47	42	89.4
Harvard University Medical School	110	72	65.5

TABLE 17 — Continued

College	1930 graduates* Total	Engaged in private practice Number	Per cent of total
Howard University College of Medicine	34	31	91.2
University of Illinois College of Medicine	91	68	74.7
Indiana University School of Medicine	80	55	68.8
State University of Iowa College of Medicine	82	60	73.2
Jefferson Medical College of Philadelphia	106	85	80.2
Johns Hopkins University School of Medicine	62	33	53.2
University of Kansas School of Medicine	37	28	75.7
Long Island College of Medicine	71	69	97.2
University of Louisville School of Medicine	67	54	80.6
Loyola University School of Medicine	59	53	89.8
Marquette University School of Medicine	49	42	85.7
University of Maryland School of Medicine & College of Physicians and Surgeons	62	53	85.5
College of Medical Evangelists	56	36	64.3
Meharry Medical College	25	23	92.0
University of Michigan Medical School	126	99	78.6
University of Minnesota Medical School	95	72	75.8
University of Nebraska College of Medicine	59	41	69.5
New York Homeopathic Medical College & Flower Hospital	52	47	90.4
New York University College of Medicine	88	85	96.6
Northwestern University Medical School	93	69	74.2
Ohio State University College of Medicine	47	37	78.7
University of Oklahoma School of Medicine	41	29	70.7
University of Oregon Medical School	35	24	68.6
University of Pennsylvania School of Medicine	97	77	79.4
University of Pittsburgh School of Medicine	54	48	88.9
University of Rochester School of Medicine	22	18	**
Rush Medical College (University of Chicago)	98	67	68.4
St. Louis University School of Medicine	86	69	80.2
Medical College of the State of South Carolina	27	21	77.8
Stanford University School of Medicine	43	35	81.4
Syracuse University College of Medicine	39	36	92.3
Temple University School of Medicine	35	31	88.6
University of Tennessee College of Medicine	60	44	73.3
University of Texas School of Medicine	32	26	81.3
Tufts College Medical School	81	67	82.7
Tulane University of Louisiana School of Medicine	70	54	77.1
Vanderbilt University School of Medicine	33	18	54.5
University of Vermont College of Medicine	21	19	**
Medical College of Virginia	75	52	69.3
University of Virginia Department of Medicine	44	29	65.9
Washington University School of Medicine	58	42	72.4
Wayne University College of Medicine	40	35	87.5
Western Reserve University School of Medicine	52	37	71.2
University of Wisconsin Medical School	28	20	71.4
Woman's Medical College of Pennsylvania	10	7	**
Yale University School of Medicine	43	26	60.5
Canadian Colleges	272	203	74.6
University of Alberta Faculty of Medicine	17	13	**
Dalhousie University Faculty of Medicine	13	11	**
Laval University Faculty of Medicine	24	24	**
University of Manitoba Faculty of Medicine	24	20	**
McGill University Faculty of Medicine	56	39	69.6
University of Montreal Faculty of Medicine	26	21	80.8
Queen's University Faculty of Medicine	30	20	66.7
University of Toronto Faculty of Medicine	64	40	62.5
University of Western Ontario Medical School	18	15	**
All Colleges	3699	2869	77.6
American Colleges	3427	2666	77.8
Canadian Colleges	272	203	74.6

*Excluding eleven graduates who are not practicing.
**Per cent not shown when base is less than twenty-five.

Table 18. 1930 graduates of American and Canadian medical colleges who are engaged in private and non-private practice, according to type of practice.

Type of practice	1930 graduates of American colleges				1930 graduates of Canadian colleges			
	Private practice		Non-private practice		Private practice		Non-private practice	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All types	2666	100.0	761	100.0	203	100.0	69	100.0
General practice	955	35.8	124	16.3	85	41.9	4	5.8
General practice with special attention to specialty	1192	44.7	122	16.0	79	38.9	12	17.4
Limited to specialty	519	19.5	515	67.7	39	19.2	53	76.8

Table 19. Medical college graduates* who have limited their practice, according to specialty: 1915, 1920, 1925, and 1930.

Specialty	All graduates*		1915 graduates		1920 graduates		1925 graduates		1930 graduates	
	Number	Per cent distribution	Number	Per cent bution distri-	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All specialties	3656	100.0	751	100.0	682	100.0	1097	100.0	1126	100.0
Eye, ear, nose and throat	622	17.0	169	22.5	124	18.2	183	16.7	146	13.0
Internal medicine	651	17.8	136	18.1	125	18.3	190	17.3	200	17.8
Surgery	660	18.1	152	20.2	106	15.5	203	18.5	199	17.7
Pediatrics	315	8.6	45	6.0	77	11.3	109	9.9	84	7.5
Gynecology and obstetrics	228	6.2	44	5.9	46	6.7	75	6.8	63	5.6
Neuropsychiatry	285	7.8	35	4.7	45	6.6	64	5.8	141	12.5
Genito-urinary	178	4.9	40	5.3	40	5.9	52	4.7	46	4.1
Laboratory and radiology	330	9.0	57	7.6	59	8.6	92	8.4	122	10.8
Public health	144	3.9	26	3.5	22	3.2	50	4.6	46	4.1
Industrial medicine and surgery	50	1.4	18	2.4	9	1.3	15	1.4	8	0.7
Syphilology and dermatology	74	2.0	7	0.9	15	2.2	31	2.8	21	1.9
All other specialties	119	3.3	22	2.9	14	2.0	33	3.0	50	4.4

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

show the smallest percentages of graduates in private practice; whereas Albany Medical College, Georgetown University School of Medicine, Long Island College of Medicine, and New York University College of Medicine show the highest percentages.

Table 18 shows the 1930 graduates of American and Canadian medical colleges who are engaged in private and non-private practice according to the type of practice they are carrying on. As compared with Table 12, this table shows that only 19.5 per cent of the 1930 graduates of American colleges, and 19.2 per cent of the 1930 graduates of Canadian colleges who are engaged in private practice have limited their practice to a specialty. It also indicates that 67.7 per cent of the graduates of American colleges who are not in private practice are limiting their practice to a specialty. Practically all of these are occupying full-time paid positions. The same is true of those who are not in private practice but whose practice is indicated as general, or general with special attention to a specialty. This latter group are to be found in such positions as city physician, industrial physician, school physician, institutional physician, and officers in the Army or Navy.

Limitation to a Specialty

Table 19 shows the graduates of the various years who have limited their practice to a specialty according to the specialty they are practicing. The data for the 1915 graduates represent conditions eleven years after graduation, but at the same time they do represent the relative popularity of the various specialties with the graduates of that year in a manner similar to that indicated for the graduates of the succeeding years. This table shows some interesting trends. Among those who have limited their practice to a specialty, Eye, Ear, Nose and Throat has become progressively less popular with each succeeding group of graduates. Pediatrics as a specialty showed its greatest popularity among the graduates of 1920. With the 1925 and 1930 graduates it has been less popular. Neuropsychiatry has shown a marked increase in popularity with the 1930 graduates.

Table 20 shows the 1925 and 1930 graduates of American and Canadian

Table 20. 1925 and 1930 graduates of American and Canadian medical colleges who limited their practice six years after graduation, according to specialty.

Specialty	1925 graduates				1930 graduates			
	American colleges		Canadian colleges		American colleges		Canadian colleges	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All specialties	1001	100.0	96	100.0	1034	100.0	92	100.0
Eye, ear, nose and throat	171	17.1	12	12.5	136	13.2	10	10.9
Internal medicine	177	17.7	13	13.5	186	18.0	14	15.2
Surgery	192	19.2	11	11.5	178	17.2	21	22.8
Pediatrics	103	10.3	6	6.3	79	7.6	5	5.4
Gynecology and obstetrics	71	7.1	4	4.2	60	5.8	3	3.3
Neuropsychiatry	43	4.3	21	21.9	128	12.4	13	14.1
Genito-urinary	51	5.1	1	1.0	45	4.4	1	1.1
Laboratory and radiology	88	8.8	8	8.3	108	10.4	14	15.2
Public health	41	4.1	9	9.4	44	4.3	2	2.2
Industrial medicine and surgery	11	1.1	4	4.2	7	0.7	1	1.1
Syphilology and dermatology	30	3.0	1	1.0	20	1.9	1	1.1
All other specialties	23	2.3	6	6.3	43	4.2	7	7.6

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

colleges who have limited their practice six years after graduation, according to the specialty. This table indicates that in general the trends are the same for the graduates of American and Canadian colleges. However, there are several striking differences. The 1930 graduates of American colleges who have limited their practice have shown a decreased tendency to choose surgery as a specialty as compared with the 1925 graduates. With the 1930 graduates of Canadian colleges, surgery was twice as popular as it was with the 1925 graduates. Neuropsychiatry was nearly three times as popular with the 1930 graduates of American colleges as it was with the 1925 graduates. However, it was not as popular with the 1930 graduates of the Canadian colleges as it was with the 1925 graduates. Likewise, public health was not as popular with the 1930 graduates of Canadian colleges.

Table 21 shows the 1930 graduates of American and Canadian colleges in private and non-private practice who have limited their practice to a specialty according to the various specialties. The graduates of the American and Canadian colleges show few striking differences. In view of the fact that practically all of those in non-private practice are occupying full-time paid positions, it is not surprising that Neuropsychiatry, and Laboratory and Radiology appear as the most popular specialties with this group.

Table 21. 1930 graduates of American and Canadian medical colleges in private and non-private practice who have limited their practice, according to specialty.

Specialty	1930 graduates of American colleges				1930 graduates of Canadian colleges			
	Private practice		Non-private practice		Private practice		Non-private practice	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All specialties	519	100.0	515	100.0	39	100.0	53	100.0
Eye, ear, nose and throat	98	18.8	38	7.4	8	20.5	2	3.8
Internal medicine	104	20.0	82	15.9	8	20.5	6	11.3
Surgery	90	17.3	88	17.1	11	28.2	10	18.9
Pediatrics	66	12.7	13	2.5	3	7.7	2	3.8
Gynecology and obstetrics	45	8.7	15	2.9	1	2.6	2	3.8
Neuropsychiatry	34	6.6	94	18.3	3	7.7	10	18.9
Genito-urinary	29	5.6	16	3.1	1	2.6	—	—
Laboratory and radiology	21	4.0	87	16.9	2	5.1	12	22.6
Public health	2	0.4	42	8.2	—	—	2	3.8
Industrial medicine and surgery	3	0.6	4	0.8	1	2.6	—	—
Syphilology and dermatology	15	2.9	5	1.0	—	—	1	1.9
All other specialties	12	2.3	31	6.0	1	2.6	6	11.3

Experience in General Practice Before Limitation to a Specialty

Formerly graduates considered it advisable to secure several years' experience in the general practice of medicine before preparing for the practice of a specialty. As is indicated in Table 22, a progressively increasing percentage of those limiting their practice to a specialty are doing so without having had any experience in general practice aside from that involved in connection with an interneship or residency. As a matter of fact, it is apparently becoming increasingly difficult for physicians who have been in general practice to secure opportunities for a satisfactory training in the specialties. Institutions offering such opportunities for training apparently prefer to give appointments to graduates who have just com-

Table 22. Medical college graduates* for specified years who have limited their practice to a specialty, according to years of general practice: 1915, 1920, 1925, and 1930.

Years of general practice	All graduates*		1915 graduates		1920 graduates		1925 graduates		1930 graduates	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
Total	3656	100.0	751	100.0	682	100.0	1097	100.0	1126	100.0
No general practice	1937	53.0	227	30.2	348	51.0	586	53.4	776	68.9
General practice	1719	47.0	524	69.8	334	49.0	511	46.6	350	31.1
Less than two years	371	10.1	48	6.4	91	13.4	133	12.1	99	8.8
Two to four years	758	20.7	168	22.4	183	26.8	274	25.0	133	11.8
Five to nine years	347	9.5	254	33.8	41	6.0	40	3.6	12	1.1
Ten years and over	36	1.0	36	4.8	---	---	---	---	---	---
Time not reported	207	5.7	18	2.4	19	2.8	64	5.8	106	9.4

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

Table 23. Medical college graduates* in specified years, according to kind of paid position.

Kind of paid position	All graduates*		1915 graduates		1920 graduates		1925 graduates		1930 graduates	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
Total	10710	100.0	1834	100.0	1947	100.0	3230	100.0	3699	100.0
With full-time paid position	2245	21.0	278	15.2	342	17.6	570	17.6	1055	28.5
With part-time paid position	2049	19.1	301	16.4	388	19.9	629	19.5	731	19.8
With no paid position	6416	59.9	1255	68.4	1217	62.5	2031	62.9	1913	51.7

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

Table 24. 1925 and 1930 graduates holding full-time and part-time paid positions, according to medical college.

College	1925 graduates: Total	1925 graduates: With full-time paid positions		1925 graduates: With part-time paid positions		1930 graduates: Total	1930 graduates: With full-time paid positions		1930 graduates: With part-time paid positions	
		Number	Per cent of total	Number	Per cent of total		Number	Per cent of total	Number	Per cent of total
All colleges	3230	570	17.6	629	19.5	3699	1055	28.5	731	19.8
American colleges	2948	493	16.7	584	19.8	3427	962	28.1	680	19.8
Albany Medical College	13	2	*	2	*	14	—	—	9	*
University of Arkansas School of Med.	21	2	*	7	*	22	14	*	4	*
Baylor University College of Medicine	25	5	20.0	3	12.0	71	17	23.9	6	8.5
Boston University School of Medicine	36	4	11.1	12	33.3	38	4	10.5	10	26.3
University of Buffalo School of Med.	38	4	10.5	11	28.9	40	7	17.5	12	30.0
University of California Med. School	42	4	9.5	11	26.2	37	10	27.0	10	27.0
University of Cincinnati Coll. of Med.	57	12	21.1	14	24.6	43	12	27.9	11	25.6
University of Colorado School of Med.	26	6	23.1	6	23.1	36	16	44.4	7	19.4
Columbia Univ. Coll. of Phys. & Surg.	77	4	5.2	28	36.4	73	14	19.2	24	32.9
Cornell University Medical College	41	3	7.3	8	19.5	42	11	26.2	9	21.4
Creighton University School of Med.	28	3	10.7	5	17.9	35	8	22.9	3	8.6
Emory University School of Medicine	49	4	8.2	7	14.3	36	12	33.3	4	11.1
Georgetown University School of Med.	29	4	13.8	7	24.1	61	4	6.6	22	36.1
George Washington U. School of M.	36	7	19.4	15	41.7	32	8	25.0	—	—
University of Georgia School of Med.	19	11	*	1	*	25	8	32.0	1	4.0
Hahnemann Med. College and Hospital	35	2	5.7	8	22.9	47	6	12.8	16	34.0
Harvard University Medical School	96	21	21.9	25	26.0	110	46	41.8	26	23.6
Howard University College of Med.	41	1	2 4	4	9.8	34	4	11.8	12	35.3
University of Illinois College of Med.	83	15	18.1	16	19.3	91	27	29.7	21	23.1
Indiana University School of Medicine	73	14	19.2	10	13.7	80	27	33.8	6	7.5
State University of Iowa Coll. of Med.	68	27	39.7	8	11 8	82	25	30.5	14	17.0
Jefferson Medical Coll. of Philadelphia	100	7	7.0	32	32.0	106	25	23.6	21	19.8
Johns Hopkins Univ. School of Med.	60	22	36.7	12	20.0	62	30	48.4	11	17.7
University of Kansas School of Med.	23	7	*	6	*	37	15	40.5	8	21.6
Long Island College of Medicine	73	—	—	13	17.8	71	4	5.6	15	21.1
Univ. of Louisville School of Medicine	51	7	13.7	13	25 5	67	18	26.9	10	14.9
Loyola University School of Medicine	30	1	3.3	5	16.7	59	10	16.9	11	18.6
Marquette University School of Med.	29	1	3.4	9	31.0	49	8	16.3	12	24.5
Univ. of Maryland School of Med. and College of Physicians and Surgeons	62	6	9 7	14	22.6	62	11	17.7	10	16.1
College of Medical Evangelists	50	8	16.0	2	4.0	56	21	37.5	10	17.9
Meharry Medical College	19	—	—	2	*	25	2	8.0	4	16.0
University of Michigan Med. School	121	26	21.5	19	15.7	126	36	28.6	20	15.9
University of Minnesota Med. School	72	28	38.9	13	18.1	95	30	31.6	12	12.6
University of Nebraska Coll. of Med.	81	22	27.2	8	9.9	59	21	35.6	10	16.9

University of Minnesota Med. School	72	28	38.9	13	18.1	95	30	31.6	12	12.6
University of Nebraska Coll. of Med.	81	22	27.2	8	9.9	59	21	35.6	10	16.9
New York Homeopathic Med. Coll. and and Flower Hospital	16	1	•	1	•	52	7	13.5	10	19.2
New York University College of Med.	74	5	6.8	13	17.6	88	10	11.4	23	26.1
Northwestern University Med. School	80	9	11.3	14	17.5	93	33	35.5	16	17.2
Ohio State University College of Med.	62	8	12.9	13	21.0	47	15	31.9	12	25.5
Univ. of Oklahoma School of Med.	19	5	•	1	•	41	12	29.3	8	19.5
University of Oregon Medical School	42	9	21.4	12	28.6	35	13	37.1	7	20.0
Univ. of Pennsylvania School of Med.	100	23	23.0	23	23.0	97	29	29.9	27	27.8
Univ. of Pittsburgh School of Med.	36	3	8.3	8	22.2	54	18	33.3	14	25.9
Univ. of Rochester School of Medicine	**	—	—	—	—	22	5	•	7	•
Rush Medical Coll. (Univ. of Chicago)	87	12	13.8	27	31.0	98	38	38.8	18	18.4
St. Louis University School of Med.	65	4	6.2	8	12.3	86	19	22.1	18	20.9
Medical College of the State of South Carolina	26	3	11.5	5	19.2	27	7	25.9	7	25 9
Stanford University School of Med.	22	5	•	6	•	43	18	41.9	10	23.3
Syracuse University College of Med.	35	2	5.7	10	28.6	39	4	10.3	13	33.3
Temple University School of Medicine	29	3	10.3	5	17.2	35	9	25.7	5	14.3
University of Tennessee Coll. of Med.	47	15	31.9	5	10.6	60	21	35.0	5	8.3
University of Texas School of Med.	46	8	17.4	7	15.2	32	8	25.0	4	12 5
Tufts College Medical School	79	10	12.7	19	24.1	81	15	18.5	20	24.7
Tulane University of Louisiana School of Medicine	66	8	12.1	11	16.7	70	19	27.1	15	21.4
Vanderbilt University School of Med.	35	5	14.3	2	5.7	33	16	48.5	2	6.1
University of Vermont College of Med.	24	1	•	4	•	21	2	•	4	•
Medical College of Virginia	45	10	22.2	4	8.9	75	30	40.0	13	17.3
University of Virginia Dept. of Med.	45	16	35.6	4	8.9	44	18	40.9	7	15.9
Washington University School of M.	56	15	26.8	8	14.3	58	20	34.5	9	15.5
Wayne University College of Medicine	22	2	•	4	•	40	6	15.0	6	15.0
Western Reserve Univ. School of M.	32	10	31.3	6	18.8	52	20	38.5	6	11.5
University of Wisconsin Med. School	**	—	—	—	—	28	11	39.3	7	25.0
Woman's Med. Coll. of Pennsylvania	17	4	•	4	•	10	6	•	1	•
Yale University School of Medicine	37	7	18.9	4	10.8	43	22	51.2	5	11.6
Canadian Colleges	282	77	27.3	45	16.0	272	93	34.2	51	18.8
University of Alberta Faculty of Med.	7	—	—	1	•	17	6	•	4	•
Dalhousie University Faculty of Med.	28	9	32.1	3	10.7	13	3	•	6	•
Laval University Faculty of Medicine	17	2	•	4	•	24	3	•	6	•
University of Manitoba Faculty of M.	30	6	20.0	5	16.7	24	11	•	—	—
McGill University Faculty of Medicine	59	18	30.5	5	8.5	56	21	37.5	9	16.1
University of Montreal Faculty of M.	39	12	30.8	2	5.1	26	6	23.1	5	19.2
Queen's University Faculty of Med.	**	—	—	—	—	30	10	33.3	3	10.0
University of Toronto Faculty of M.	86	25	29.1	22	25.6	64	29	45.3	12	18.8
University of W. Ontario Med. School	16	5	•	3	•	18	4	•	6	•

*Percentage not shown when base is less than 25.
**Not included in 1925 study.

pleted interneships or residencies and have not interrupted their more formal training by spending time in the private practice of medicine.

Paid Positions

Table 23 shows the medical college graduates in specified years according to full-time or part-time paid positions they are holding. All who have been familiar with recent developments in the field of medicine have recognized that there have become available an increasing number of paid positions open to medical college graduates. As is shown by the table, both the absolute number and the percentage of 1930 graduates occupying full-time paid positions show a marked increase over the 1915, 1920, and 1925 graduates. Although the general economic conditions prevailing between 1930 and 1936 may be offered as an explanation of the marked increase in the number of 1930 graduates occupying full-time paid positions, the fact remains that there was available a sufficient number of such positions to absorb 28.5 per cent of the graduates returning the questionnaires. The percentage of graduates holding part-time paid positions has shown relatively little change.

Table 24 shows for the individual colleges the number and percentage of 1925 and 1930 graduates holding full-time and part-time paid positions six years after graduation. This table indicates that a somewhat larger percentage of the graduates of Canadian colleges are occupying full-time paid positions. Yale University School of Medicine, Vanderbilt University School of Medicine, and Johns Hopkins University School of Medicine show the largest percentages of 1930 graduates occupying full-time paid positions. Here again it should be pointed out that probably a certain number of the 1930 graduates now holding full-time paid positions can be considered as still in training.

The nature of the full-time and part-time positions occupied by the graduates of the different years is shown in Table 25. This table indicates a marked increase in the number of full-time positions in hospitals and institutions, in medical colleges, in governmental activities, and in laboratories. Those holding full-time and part-time positions in public health activities are separated and appear under several headings in the table. Together they indicate a progressive increase in the number of graduates in paid positions in this field. On the other hand, the numbers occupying full-time paid positions in industry, insurance, group-practice, and school medical inspection show a decrease as compared with the 1925 graduates.

Table 26 shows more detailed data for the 1930 graduates. The first section of the table shows data for all graduates holding full-time and part-time positions according to type of practice and according to the nature of the paid position.

Graduates Limiting their Practice and Holding Paid Positions

Table 27 shows the number of graduates of the different years returning questionnaires who have limited their practice to a specialty, together with the number holding full-time and part-time paid positions according to the various specialties. The upper line of figures gives the totals for all specialties. These indicate a progressive increase in the proportion of those limiting their practice to a specialty and occupying full-time paid positions. Probably a certain number of those holding full-time paid positions must be considered as still in training for later private practice. Many also are limiting their practice to a specialty merely because of the nature of the paid position they are holding.

Table 25. Medical college graduates* holding paid positions, according to kind of position: 1915, 1920, 1925, and 1930.

Paid position	All graduates studied*		1915 graduates		1920 graduates		1925 graduates		1930 graduates	
	With full-time positions	With part-time positions	With full-time positions	With part-time positions	With full-time positions	With part-time positions	With full-time positions	With part-time positions	With full-time positions	With part-time positions
All paid positions	2245	2049	278	301	342	388	570	629	1055	731
Hospitals and institutions	592	189	62	31	99	45	146	51	285	62
Tuberculosis sanatoria	90	18	12	—	11	5	28	4	39	9
Hospitals for the insane	71**	4	**	**	**	**	22	—	49	4
Superintendents of hospitals and sanatoria	34**	7	**	**	**	**	15	—	19	7
Hospitals (not listed above)	370	121	47	26	81	33	73	37	169	25
Other institutions	27	39	3	5	7	7	8	10	9	17
Medical college (teaching and research)	144	223	21	46	34	59	32	77	57	41
Hospital and medical college	69	49	4	10	17	6	22	20	26	13
Governmental work	486	352	104	59	52	62	103	98	227	133
Army and Navy	205	3	61	2	11	—	44	—	89	1
Civilian Conservation Corps	41	5	—	—	—	—	—	—	41	5
U. S. Public Health Service	52	15	14	1	7	2	12	7	19	5
Veteran's Bureau	60	20	20	11	12	6	11	1	17	2
W. P. A. and allied relief agencies	6	10	—	—	—	—	—	—	6	10
State health departments	27	12	2	4	6	6	8	1	11	1
City and county health departments	66	187	7	39	12	45	22	50	25	53
Other governmental activities	29	100	—	2	4	3	6	39	19	56
Public health (not elsewhere classified)	73	315	6	42	14	68	20	105	33	100
Clinic service	28	120	—	13	3	23	6	41	19	43
School medical inspection	16	184	3	27	7	45	4	60	2	52
Other public health work	29	11	3	2	4	—	10	4	12	5
Industrial	139	280	21	56	23	66	51	85	44	73
Associate or assistant to other physician	117	77	8	4	24	14	26	22	59	37
Laboratory (not elsewhere classified)	97	60	11	3	8	11	25	17	64	32
Insurance	22	138	7	12	5	13	8	29	2	84
Group practice	160	7	13	—	37	1	56	6	54	—
Fellowship (on salary)	64	6	—	—	1	—	21	2	42	4
Medical research	30	12	2	2	6	1	8	3	14	6
Medical missionary	30	—	2	—	7	—	2	—	19	—
All other paid positions	124	126	1	4	—	4	24	50	88	65
Two or more positions	65	179	11	22	6	30	15	57	33	70
Medical position, but nature not stated	33	36	5	10	9	8	11	7	8	11

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.
**In 1915 and in 1920 hospital superintendents and physicians employed in hospitals for the insane were included with those employed in hospitals (not listed above).

Table 26. 1930 graduates holding paid positions, according to the kind of paid position.

Paid position	1930 graduates holding paid positions								
		Full-time positions				Part-time positions			
	Total	Total	General practice	General plus attention to specialty	Limited to specialty	Total	General practice	General plus attention to specialty	Limited to specialty
All paid positions	1786	1055	191	216	648	731	235	344	152
Hospitals and institutions	347	285	18	37	230	62	11	28	23
Tuberculosis sanatoria	48	39	—	2	37	9	1	4	4
Hospitals for the insane	53	49	2	4	43	4	—	2	2
Superintendents of hospitals and sanatoria	26	19	1	1	17	7	2	4	1
Hospitals (not listed above)	194	169	14	26	129	25	4	13	8
Dispensaries	4	—	—	—	—	4	—	—	4
Other institutions	22	9	1	4	4	13	4	5	4
Medical college (teaching and research)	98	57	1	4	52	41	1	16	24
Hospital and medical college	39	26	1	1	24	13	1	5	7
Government work	360	227	105	67	55	133	68	55	10
United States or Canadian Army	45	44	20	21	3	1	—	1	—
United States Navy	45	45	26	13	6	—	—	—	—
Civilian Conservation Corps*	46	41	27	10	4	5	4	1	—
United States Public Health Service	24	19	7	2	10	5	—	5	—
Veterans' Bureau	19	17	7	1	9	2	1	—	1
W. P. A. and allied relief agencies	16	6	2	3	1	10	7	1	2
State health departments	12	11	2	1	8	1	—	—	1
City and county health departments	78	25	7	4	14	53	28	22	3
Other governmental activities**	75	19	7	12	.	56	28	25	3
Public health (not elsewhere classified)	133	33	3	5	25	100	31	51	18
Clinic service	62	19	2	3	14	43	4	25	14
School medical inspection	54	2	1	1	—	52	22	26	4

Other public health work	17	12	—	1	11	5	5	—	—
Industrial	117	44	15	25	4	73	33	33	7
Associate or assistant to other physician	96	59	7	16	36	37	7	18	12
Laboratory (not elsewhere classified)	96	64	—	3	61	32	2	15	15
Pathologist	44	33	—	1	32	11	1	4	6
Radiologist	34	20	—	—	20	14	—	7	7
Other laboratory work	18	11	—	2	9	7	1	4	2
Insurance	86	2	—	—	2	84	30	47	7
Psychiatrist (not elsewhere classified)***	60	56	—	1	55	4	—	1	3
Group practice	54	54	5	26	23	—	—	—	—
Fellowship (on salary)	46	42	1	1	40	4	—	1	3
Fraternal organization	28	3	2	1	—	25	13	11	1
University health service	26	14	9	2	3	12	2	9	1
Medical research	20	14	—	—	14	6	—	3	3
Medical missionary	19	19	9	9	1	—	—	—	—
Social, religious, or welfare agency (private)	11	1	—	—	1	10	2	7	1
Anesthetist	10	2	—	1	1	8	2	5	1
Hotel or resort (spa)	4	3	2	—	1	1	—	1	—
Medical consultant to commercial firm	3	2	—	—	2	1	1	—	—
Teaching non-medical groups****	3	1	1	—	—	2	—	1	1
All other medical positions	6	4	—	—	4	2	—	2	—
Two or more medical positions	103	33	9	14	10	70	27	29	14
Non-medical position	2	2	—	1	1	—	—	—	—
Medical position but nature not stated	19	8	3	2	3	11	4	6	1

*Some graduates stated that as officers in the Army Medical Corps they were assigned to C.C.C. camps and such physicians were tabulated as army officers; on the other hand, others working in C.C.C. camps did not state that they belonged to the Army and therefore were considered as physicians holding positions in the C.C.C.

**Of the 75 graduates engaged in "other governmental activities", 13 worked for federal departments other than those listed, 6 for other state departments, 47 for other city and county departments (largely coroners, city poor physicians, etc.), and 9 stated merely that they were employed by the government.

***60 physicians reported that they were holding positions as psychiatrists but did not state where; in addition, 53 physicians said that they were employed in hospitals for the insane, but did not always indicate in what capacity. Considerable overlapping of this type is unavoidable because the returns concerning positions held were not standardized.

****Teaching nurses, dentists, social workers, etc.

Table 28 shows the graduates of the various years who are holding full-time and part-time positions according to the type of practice they are carrying on. This table shows a definite increase in the number and percentage of 1930 graduates in general practice who are occupying full-time and part-time paid positions. The percentage of those who have limited their practice to a specialty and are holding full-time paid positions has decreased, but the absolute number has progressively increased with each group studied.

Interneship and Graduate Training

During recent years the interneship has come to be recognized as an important feature in medical education and many colleges in this country have actually included it in the undergraduate curriculum in that it has been made a requirement for the M.D. degree. Certain of the states have also recognized the importance of the interneship by making it a requirement for admission to the licensing examination.

In connection with the study of the 1930 graduates, information was sought in regard to interneships and other graduate training. To avoid confusion in regard to the classification of the various types of interneships it was felt best to use but two classes: i. e., "Rotating or General", and "Other kinds" of interneships. This latter group includes the "straight" or "specialized" and so-called "mixed" interneships.

Table 29 shows the 1930 graduates as to specified type of interneships and additional graduate training. The upper section of the table gives the information in regard to the group as a whole according to the type of practice they are carrying on. The other sections give separate data for those who are in private practice and those in non-private practice. It is interesting to note that only 21 or .6 per cent of all the graduates returning the questionnaires had no graduate training whatever after completing the four-year course in medicine before entering practice. Seven of this group stated that they were forced to forego an interneship or other graduate work because of financial difficulties. It is also worthy of note that 56.6 per cent of the entire group had graduate training beyond an interneship before entering practice. Of those in private practice, 50.8 per cent had such additional training after interneship as compared with 76.6 per cent of those in the non-private practice of medicine.

Comments by Graduates

A great variety of attitudes toward medical practice was expressed under "Remarks" in the questionnaires. Many of the 1930 graduates are apparently dissatisfied with their present activities in medical practice. One hundred expressed a desire to specialize in different or more limited fields than those in which they are now practicing. Many of these expressed a desire to change to a specialty entirely different from that which they are now following. The inference is that most of this latter group are in their present specialty merely because it offered an opportunity to secure a paid position. However, as soon as finances permit they look forward to practice in the phase of medicine in which they are primarily interested. Nearly fifty expressed a desire for a residency or other opportunity to secure graduate training in preparation for specialization. Forty-seven indicated that they were still in training and that they planned on further preparation. Twenty frankly stated that they were having financial difficulties, and six of these stated that they were in urgent need of some kind of

Table 27. Medical college graduates who are limiting their practice and those holding paid positions, according to specialty:

Table 27. Medical college graduates* who are limiting their practice and those holding paid positions, according to specialty: 1915, 1920, 1925, and 1930.

Specialty	All graduates studied*			1915 graduates			1920 graduates			1925 graduates			1930 graduates		
	Total	With full-time paid positions	With part-time paid positions	Total	With full-time paid positions	With part-time paid positions	Total	With full-time paid positions	With part-time paid positions	Total	With full-time paid positions	With part-time paid positions	Total	With full-time paid positions	With part-time paid positions
All specialties	3656	1475	604	751	188	133	682	234	122	1097	405	197	1126	648	152
Eye, ear, nose and throat	622	143	83	169	14	21	124	55	11	183	27	27	146	47	24
Internal medicine	651	208	137	136	31	26	135	8	22	190	66	44	200	103	45
Surgery	660	258	112	152	36	35	106	34	21	203	68	41	199	120	15
Pediatrics	315	46	99	45	3	14	77	12	28	109	13	34	84	18	23
Gynecology and obstetrics	228	37	47	44	3	6	46	5	12	75	10	18	63	19	11
Neuropsychiatry	285	222	31	35	20	3	45	32	7	64	52	6	141	118	15
Genito-urinary	178	38	31	40	2	10	40	6	10	52	12	5	46	18	6
Laboratory and radiology	336	248	41	58	28	12	60	43	9	96	70	12	122	107	8
Public health	144	140	2	26	24	1	22	22	—	50	49	1	46	45	—
Industrial medicine and surgery	50	33	4	18	9	2	9	6	—	15	13	—	8	5	2
Syphilology and dermatology	74	14	13	7	1	3	15	2	2	31	1	7	21	10	1
All other specialties	113	88	4	21	17	—	13	9	—	29	24	2	50	38	2

*The 1915 graduates were studied eleven years after graduation; all subsequent classes were studied six years after graduation.

Table 28. Medical college graduates* holding full-time and part-time positions, according to type of practice: 1915, 1920, 1925, and 1930.

Type of practice	All graduates*				1915 graduates				1920 graduates				1925 graduates				1930 graduates			
	With full-time position		With part-time position		With full-time position		With part-time position		With full-time position		With part-time position		With full-time position		With part-time position		With full-time position		With part-time position	
	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution	Number	Per cent distribution
All types	2245	100.0	2049	100.0	278	100.0	301	100.0	342	100.0	388	100.0	570	100.0	629	100.0	1055	100.0	731	100.0
General practice	308	13.7	498	24.3	28	10.1	53	17.6	37	10.8	83	21.4	52	9.1	127	20.2	191	18.1	235	32.1
General practice with attention to specialty	450	20.0	945	46.1	57	20.5	114	37.8	66	19.3	183	47.2	111	19.5	304	48.3	216	20.5	344	47.1
Limited to specialty	1475	65.7	604	29.5	188	67.6	133	44.2	234	68.4	122	31.4	405	71.1	197	31.3	648	61.4	152	20.8

*The 1915 graduates were studied 11 years after graduation; all subsequent classes were studied six years after graduation.
(The data in this table are not strictly comparable for two reasons:
1. Prior to the 1930 study a few graduates not practicing were included in the total; their number comprised approximately one-half of one per cent. This fact accounts for minor discrepancies in the above table between the detail and the totals.
2. Prior to the 1930 study information was requested regarding salaried positions only, whereas in 1930 inquiry was made regarding positions paid on whatever basis. Even if the 1930 figures were restricted to a salary basis, the number of full-time positions increased from 570 in 1925 to 985 in 1930; part-time positions decreased from 629 in 1925 to 534 in 1930.)

Table 29. 1930 graduates with specified type of interneships and additional graduate training, according to type of practice.

Type of practice	All 1930 graduates	1930 graduates with rotating or general interneships				1930 graduates with other kinds of interneships*				1930 graduates with no interneships of any kind			
		Plus additional graduate training		With no additional graduate training		Plus additional graduate training		With no additional graduate training		But with special graduate training		With no additional graduate training	
		Number	Per cent of total	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total	Number	Per cent of total
All types	3699	1629	44.0	1237	33.4	467	12.6	315	8.5	30	0.8	21	0.6
General practice	1168	341	29.2	700	59.9	35	3.0	80	6.9	6	0.5	6	0.5
General practice with special attention to specialty	1405	636	45.3	470	33.5	143	10.2	142	10.1	7	0.5	7	0.5
Limited to specialty	1126	652	57.9	67	6.0	289	25.7	93	8.3	17	1.5	8	0.7
Private practice	2869	1166	40.6	1115	38.9	294	10.2	266	9.3	14	0.5	14	0.5
General practice	1040	279	26.8	649	62.4	30	2.9	71	6.8	5	0.5	6	0.6
General practice with special attention to specialty	1271	561	44.1	440	34.6	126	9.9	131	10.3	6	0.5	7	0.6
Limited to specialty	558	326	58.4	26	4.7	138	24.7	64	11.5	3	0.5	1	0.2
Non-private practice	830	463	55.8	122	14.7	173	20.8	49	5.9	16	1.9	7	0.8
General practice	128	62	48.4	51	39.8	5	3.9	9	7.0	1	0.8	—	—
General practice with special attention to specialty	134	75	56.0	30	22.4	17	12.7	11	8.2	1	0.7	—	—
Limited to specialty	568	326	57.4	41	7.2	151	26.6	29	5.1	14	2.4	7	1.2

*Includes those who completed rotating and specialized interneships; specialized interneships only; and six whose interneships were not reported as to type.

paid position. Eleven stated that they thoroughly enjoyed general practice and would not consider specialization. A considerable group expressed their personal views in regard to medical education, graduate training, and medical practice. Many of the comments indicated a sincerity of purpose and an earnest desire to serve the public. The following statements from two of the graduates are indicative of this spirit:

> "Am striving toward surgery. Am holding no paid positions. Am doing fifty per cent charity work. Expect no pay, because the clinic in this city is too poor because of politics. Am doing all I can to help the sick."

> "I intend going into practice in a rural community too poor to support a physician as soon as I double my present savings and will no longer be dependent on my practice for financial support. I like general work and expect to derive keen enjoyment for many years providing medical care to a community which must now do without such care."

One of the problems frequently involved in rural practice is evidenced by the following comment:

> "I am the only physician in this town. The county pays $400 per year for the county work. This does not pay for my car expense, but the county says to take it or leave it. If I don't take it I have to do the work anyway, being the only man here."

Summary

There is here presented certain statistical data based on studies of the graduates of the medical schools of this country over a period of twenty years. Although there are many complicating factors which make interpretations difficult, certain definite tendencies are clearly evident.

Increased requirements for admission to the medical colleges have apparently had little influence on the average age of the students at the time of graduation. As a matter of fact, a larger percentage of the 1930 graduates were under twenty-four years of age at the time of graduation than were the graduates of either 1925 or 1920.

A considerable percentage of the graduates of the Canadian medical colleges practice in the United States. However, the percentage locating in the United States has decreased from 39 per cent for the 1925 graduates to 24 per cent for the 1930 graduates.

The distribution of the graduates in the United States appears to be more on an economic than on a population basis.

A larger percentage of the graduates of 1930 have located in rural areas than any of the previous years studied. The explanation of this trend is by no means easy. The larger number of graduates may have resulted in such a surplus of physicians that opportunities in the smaller communities appear relatively more attractive than they previously did. It is true that, although the percentages are smaller, practically as many or more graduates are locating in the larger communities. However, it may be that population movements and

improved economic conditions are factors in this definite trend toward the rural areas.

Although the percentages are smaller, the actual number of graduates who have limited their practice to a specialty within six years after graduation has progressively increased. Here again interpretations are difficult. One of the main complicating factors is the number of available full-time paid positions which are of such a nature that they automatically limit the practice of those who accept them. There has apparently occurred a marked increase in the number of graduates of American medical colleges who have limited their practice to Neuropsychiatry. This increase is largely explained by the number of full-time paid positions available in the mental hospitals of the country. Increase in the number of graduates who have limited their practice to Laboratory and Radiology and to Public Health is probably explained on a similar basis.

When we consider only the graduates who are engaged in the private practice of medicine, 19.5 per cent of the 1930 graduates have limited their practice to a specialty as compared with 67.7 per cent of those who are not in private practice. Inasmuch as practically all of those not in private practice are holding full-time paid positions, this difference emphasizes the importance of full-time paid positions as a factor in influencing the trend toward specialization.

A progressively increasing number and percentage of medical college graduates are occupying full-time paid positions. More than a quarter of the graduates of 1930 are now holding such positions. A small percentage of this group are undoubtedly still in training, but the number is far too small to explain the trend toward such positions.

Practically every 1930 graduate of the medical colleges of the country who returned a questionnaire served an interneship or had other graduate training before beginning practice. More than half of all graduates had graduate training beyond an interneship before entering practice.

The available data indicates that the graduates of the individual medical colleges show rather consistent tendencies. This suggests a very definite influence of the medical college on the nature of the career of its graduates in the field of medical practice.

It is with pleasure that I acknowledge the assistance of Miss Mary V. Dempsey in the statistical studies here presented.